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Slight Gains Recorded in August

Sales of Iron and Steel in Past Month Reflect Improvement—Foundry Iron Is Shaded in Competition—Week's Structural Awards Mount—Coke Prices Respond to Strike Threat

WITH the end of the month at hand, producers and consumers of iron and steel find that August business has been better than that of July. This slight improvement, coupled with the present firmness of finished steel prices, the satisfactory condition of rolling schedules, and the unusual efficiency of the railroads in the matter of deliveries, forms the basis for the somewhat general feeling that iron and steel business will be maintained throughout the balance of the year at or above its present volume.

The three-shift plan is being adopted in many of the larger plants, the change from the old system apparently being made with comparatively little confusion. It is estimated that at least 25,000 men already have been affected by the change in the Pittsburgh district. Producers in practically all parts of the country report that there has been no difficulty in obtaining the number of extra workmen required by the adoption of the short workday.

Prices of iron and steel remain practically unchanged except in the case of foundry iron in northern Ohio where competition has resulted in shading. As a result of the almost general stability of prices, IRON TRADE REVIEW'S composite of fourteen leading iron and steel products remains at $44.84, for the third consecutive week.

Pig Iron Spotty

Sales of pig iron continue to be recorded in moderate volume, but during the week competition has prompted slight cuts in foundry iron in certain districts. The eastern and southern markets are relatively quiet, but in Chicago, where approximately 120,000 tons were sold in August as compared with 80,000 in July, prices are firm. Steelmaking iron has been purchased at Buffalo and in the valley, while in the lake district foundry iron is softer, $26, Cleveland, being the prevailing quotation. Northern Ohio makers sold 100,000 tons in August.

The threat of an anthracite coal strike already has affected the beehive coke market. The range of $4.50 to $4.75 for spot furnace fuel has given way to a spread of $5 to $5.50 ovens. Foundry coke is quoted at $5.50, minimum, as against $5.25 last week. The continued curtailment of production is a secondary factor responsible for the stronger prices. Heavy melting steel scrap, which has registered slight increases during the past few weeks, still is on the upward trend.

Steel Prices Firm

No change of importance has occurred in the finished steel market during the week. Prices remain firm and in some instances premiums are paid for prompt delivery, this being especially true in the case of plates. The closing of several large contracts for shapes is lending a momentary aspect of activity to the structural market. In the New York district more than 35,000 tons were placed in a few large awards, the most impressive of which was one for 21,000 tons for the first section of the Newark bay bridge for the Central Railroad of New Jersey. Other contracts closed involve 5000 tons for an apartment project in the Grand Central zone, New York, and 4000 tons for an assembly building for the Ford Motor Co. at River Rouge, Mich. The reported awards of shapes for the week total 48,154 tons, which is the greatest tonnage noted since IRON TRADE REVIEW'S weekly compilation was inaugurated in May, 1922.

While western railroads still are contracting for rails for 1924 delivery and for material for car repair work, orders for new cars and locomotives have fallen off sharply. Among the inquiries for rails are 10,000 tons for the Baltimore & Ohio and 35,000 tons for the Canadian National railways. A frog and switch company figured prominently in the market during the week, taking 12,000 tons of rails and 5000 of bars.

A number of large construction projects have been deferred. However, the plate market is fairly active, in spite of the fact action has been postponed on a number of ships contemplated for the lake trade.

Exports Decline

Exports and imports of iron and steel in July were less than in June, but almost double the corresponding figures for July 1922. According to IRON TRADE REVIEW'S weekly cable, Luxemburg producers have offered a Pennsylvania pipemaker 5000 to 10,000 tons of No. 3 foundry iron at the equivalent of $21.88 f.o.b. A Saar valley interest has sold 2000 tons of beams in China at $40.95.

Business Trend and Chart Section Page 591

Pig Iron Sales Still Moderate

Competition for Tonnage Leads to Some Further Price Cutting—August Sales by Chicago Interests 130,000 Tons; by Northern Ohio Makers, Over 100,000—Good Size Lots of Basic Closed at $25, Valley

PITTSBURGH, Aug. 28.—Interest in pig iron is awakening in some slight measure with purchases of basic by the Sharon Steel Hoop Co. of 4000 tons, and purchases by other melters of 1000 tons and 5000 tons, respectively. The National Malleable Castings Co. is understood to have closed on a tonnage and the Allegheny Steel Co. is reported to be planning to enter the market for 1000 tons or more. The Westinghouse Electric & Mfg. Co. has an inquiry out for 1200 tons of foundry iron, and the Monongahela Iron & Steel Co. wants 1000 tons of bessemer. The Sharon Steel Hoop Co.'s purchase was from an interest outside the valley at $24.50, furnace, with the same freight rates as from the valley. Since, however, it was high silicon iron and consequently of off-grade base, the market price of the standard article is unchanged at $25, valley. This latter figure applied in connection with the other lots mentioned, 1000 tons and 5000 tons respectively, one before and one after the Sharon transaction was consummated. On the 1000-ton bessemer iron inquiry referred to, $26.50, valley, has been quoted which has been the sales price of the several small lots closed up this week involving 50 to 200 tons each. The Pennsylvania Engineering Works, New Castle, Pa., bought three or four carloads at that figure but for the most part single carload sales rule. In addition to the 500 tons of malleable purchased by the Fort Pitt Malleable Iron Co., as noted last week at $24.50, valley, this interest bought 750 tons from another source at $25.26, delivered. This special price was made because the iron had a high silicon content. The Lancaster Foundry Co., Lancaster, Pa., since purchased 300 tons of malleable at $24.50, valley, and now wants 100 tons of high silicon iron. New inquiries for malleable are current from Ohio users, 200 and 250 tons respectively on which the usual quotations are $26 to $26.50, valley, the latter figure being made by a producer whose malleable costs are the same as on bessemer. The Westinghouse inquiry for 1200 tons of foundry iron calls for 500 tons of No. 1, 200 tons of No. 2 and 500 tons of No. 3 for delivery during September to Trafford City, Pa., and probably will be closed tomorrow. While the $24.50, valley, price on No. 2 foundry iron (1.75 to 2.25 silicon) has not entirely disappeared, the usual quotations are $25 to $26, and $26 has applied in connection with several small lot sales this week including one or two involving up to 300 tons for delivery over the last quarter. Low phosphorus copper free iron still is quoted at $32 and only small tonnages are involved in present negotiations.

New England Sales Small

Boston, Aug. 27.—Sales of pig iron were slightly larger in the past week, but business still was of small dimensions. Total sales aggregated over 2700 tons. One inquiry for 1500 tons by a Providence manufacturing concern is understood to have been closed, being divided among several dealers. Of the total, 600 tons was taken by one dealer at $25.50 base, eastern Pennsylvania. Buffalo is quoted at $25, base, but differentials are not being closely maintained on this iron, it being understood that the different grades of silicon content can be bought at the base figure. This is necessary because of the higher freight rate from Buffalo in competition with eastern Pennsylvania. An interesting transaction during the week was the sale of 200 tons of Virginia high manganese iron. Virginia and Alabama iron of standard grades cannot compete in the New England market at the present time because of the high freight rates, which are $5.92 a ton on the former and $9.60 on the latter. A variance in prices for eastern Pennsylvania iron is noted, some furnaces quoting $25.50 and others $25, base price. It is suggested that $24.50 might be quoted on an attractive volume of business. Consumers now are receiving substanial amounts of iron on old contracts. Business of jobbing foundries in this section is said to have fallen off and they are not buying much iron.

More Basic Iron Sold

Buffalo, Aug. 28.—About 7000 tons of iron of which half is basic has been sold here. The 2000-ton requirement of the Gould Coupler Co. is included in this lot, but the price is not known. That the $25 quotation on basic which has been fairly firm for several weeks was shaded in this transaction is not doubted. Small inquiries have improved. While the average quotation is $25 for No. 2 plain, this price would be shaded on desirable tonnage. The 50-cent differential is still in effect.

Little Change at New York

New York, Aug. 28.—While there appears to be no outstanding inquiry in pig iron in this market, a steady small inquiry is being received and selling is in the same volume. Some sellers find the past week has been the best in some time. One interest has booked 4500 tons and another 1000 tons, mostly foundry iron, practically all in small lots for nearby delivery. This is in addition to 1500 tons sold to the Ingersoll-Rand Co., whose inquiry was under consideration last week and 2000 tons of basic for the Gould Coupler Co. The latter went to a Buffalo furnace. The Ingersoll-Rand tonnage is said to have been divided between two Pennsylvania furnaces and is for delivery in 30 days. Much of the present small buying is for supplemental tonnages for melters who had covered their requirements earlier and now need more iron. Considerable inquiry seems to be actuated by the idea that prices may advance and a desire to obtain some tonnage at the present level. About 2500 tons is involved in outstanding inquiries, including two of 500 tons each for foundry iron for Connecticut melters. Brooke furnace, scheduled to be blown out soon, is not selling further and is engaged in filling its present orders before ceasing operation. The market seems to be firmer at $25, eastern Pennsylvania furnaces, as well as at Buffalo furnace. It is apparent that freight equalization is being resorted to less frequently and producers are not keen for additional tonnage.

Good Sales at Chicago

Chicago, Aug. 28.—Pig iron buyers are less inclined to contract for requirements. A healthy volume of inquiry continues, and big buyers are placing small lots while awaiting developments. All dealers reports August as a good month. It is estimated 120,000 tons of pig iron has been sold here in August against 80,000 for July. The week's sales include 3000 tons of foundry iron to a Wisconsin melter, 1000 and 300 tons lots of foundry to a Wisconsin melter; 1000 and 500 tons to two Chicago foundries, and 800 tons of malleable for the fourth quarter to a Wisconsin foundry. Prices generally are firm at $27, Chicago furnace. Resale southern iron is placed at $23, Birmingham. Charcoal iron sales total 800 tons. Prices are firm.

Inquiry Improves

Cincinnati, Aug. 28.—Pig iron sales the past week aggregate several thousand tons. Inquiry for small lots has developed distinct improvement. Melters continue busy and several important interests which early last month estimated they had supplies sufficient to run through the balance of the year have revised their estimates and are planning to take on additional tonnages. Foundries engaged in the manufacture of gray iron castings report business light, while those making malleable castings are extremely busy. Considerable uncertainty still exists relative to prices, and melters are bending every effort to obtain further concessions. While $26, Ironton base, represents the southern Ohio market, reports are current that $25 base can be done with at least one furnace interest on fairly large tonnage. The southern market ranges from $23.50 to $27, Birmingham base. One Tennessee furnace is reported to have sold a limited tonnage at $23 base. The sale of 1400 tons of 8 per cent silvery iron to the Studebaker Corp. for its South Bend, Ind., plant was the outstanding transaction of the week. A sale of 500 tons of malleable iron by a leading seller, also is noted. All other reported sales involve Tennessee iron. An Indiana melter took 300 tons for September and October shipment, while 500 tons went to a consumer at Toledo. Inquiries include 500 tons

of southern iron for fourth quarter delivery from the B. F. Avery & Son, Louisville, Ky. Two stove concerns in Ohio are negotiating for small tonnages. The Andrews Steel Co. at Newport, Ky., is in the market for 100 to 200 tons of bessemer.

Small Orders Flow In

St. Louis, Aug. 27.—The volume of inquiry for pig iron continues to hold up fairly well and dealers report a steady stream of small orders on which buyers desire the earliest delivery possible. Melters are running low on stocks. During the past week the attitude of furnaces relative to prices has stiffened slightly. There is less talk of concessions. In regard to contracting for last quarter and early 1924 requirements, melters are holding out for a reduction in prices and the furnace interests maintain that they cannot sell under present levels. Meantime stocks in producers' yards are increasing and consumers' reserves are dwindling. Business with the job foundries has slowed down somewhat. Makers of steel castings and malleable users are running at or close to capacity. Should the next few weeks develop additional orders for their products, they will be forced into the pig iron market. The leading local producer reports the sale of 1000 tons of basic iron for early shipment to a melter in this district. An Iowa melter took 100 tons of foundry for spot shipment and a like amount went to a nearby Illinois foundry. A local steelmaker is inquiring for 5000 tons of basic, and a Galesburg, Ill. user is asking prices on 500 to 1000 tons of malleable. Other inquiries reported are for 400 tons of foundry iron for rush shipment to an Indiana melter, 400 tons of foundry for an Illinois user and 1000 tons of 2.25 to 3.25 per cent silicon iron for a Cincinnati selling agency. Stove interests here are slowly increasing. Several leading southern producers quote $27 and declare they will not accept less. Northern iron is cheaper in this district.

Market Looking Up

Birmingham, Ala., Aug. 27.—The pig iron market in the South is showing signs of revival though large orders have been booked. Some of the large concerns are willing to make concessions on the $27 quotations, $25 being accepted on 500 to 1000 tons. The smaller interest which has been selling at $24 and $25 has withdrawn from the market. The buying has been in one, two and three car lots at a time, but inquiries have been quite encouraging. Foundries in the Birmingham district, looking forward to an early increase in operations are not well supplied with pig iron. Pressure pipe, radiator and stove makers have not lagged in melting iron, and sanitary pipe making has not been curtailed very much, though several plants are idle. Inquiries for pig iron have been received from St. Louis and Chicago territories.

Tennessee pig iron has been offered on a Birmingham base of $23.50 per ton for No. 2 foundry, it is reported, but this is made possible by a differential on freight, northern consumers alone being able to obtain this iron. The difference in freight between Birmingham and Lafollette to northern points makes it possible to offer the product at the price mentioned. Surplus stocks of iron

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More Strength in Coke

Possibilities of Coal Strike, and Continued Curtailment at Ovens Influencing Market—Some Tonnages Closed

COKE PRICES, PAGE 571

Pittsburgh, Aug. 28.—The effects of a possible anthracite coal strike are beginning to be noticed in the beehive coke market. This possibility together with the continued curtailment of production throughout the Connellsville region has made for stronger prices, higher levels being introduced on furnace and foundry grades. The spot market minimum on the former now is $5, and up to $5.25 and $5.50 are quoted both for spot and future delivery, as against $4.50 to $4.75, last week. While this $5 level was becoming established, or just before its introduction a few consumers were given an opportunity to close at $4.75. These consumers, it is understood, include the Rogers, Brown Iron Co., 5000 to 7000 tons for September, and the American Radiator Co., 10,000 tons for the same delivery. The latter interest's original inquiry asked for and acted on the same monthly tonnage for the fourth quarter. The Temple Furnace Co., Temple, Pa., wanted 6000 tons monthly and the Robesonia Iron Co. 7000 tons monthly for the fourth quarter, while the Wheeling Steel Corp. asked 5000 tons for September delivery only. Two or three of the eastern furnaces have closed up their negotiations, one late last week at $4.75 involving 7000 tons monthly for a furnace to start up at the beginning of the fourth quarter, and one for 18,000 tons for delivery over October, November and December at $5, oven, closed up early this week. Foundry coke is stronger by at least 25 cents per ton, the minimum now available being $5.50 as against $5.25 last week. The entire spread in the 72-hour fuel market is $5.50 to $7.50, certain brands bringing the latter figure although the usual market quotation is $6 and $6.50.

Beehive coke production, according to the *Connellsville Courier* for the week ending Aug. 18 was 251,400 tons as compared with 266,430 tons the preceding week.

Coke Advance Expected

New York, Aug. 28.—There is a heavy demand for foundry coke and inquiry is unusually large, apparently due to an effort of users to accumulate stocks. Several producers have withdrawn from the market and one well-known brand has been advanced to $7.50, Connellsville, an increase of 50 cents per ton. Several producers are sold as far as they desire to go. Prices as a result are strong and in many instances on a considerably higher level. A definite advance about Sept. 1 is confidently expected. Several producers are quoting a minimum of $6.50, Connellsville, for foundry fuel, while contract furnace coke is available at $5 to $5.25, Connellsville. At the moment there is little inquiry for this grade. Foundry coke thus presents a range of $6.50 to $7.50, Connellsville, with lack of desire to sell. Sot furnace coke ranges from $5.50 to $5.75, with some quotations of $6, Connellsville. Seaboard by-product foundry coke is firm at $11.41, Newark, and northern New Jersey points. This interest is practically sold over the year and is not seeking business.

By-Product Coke Advanced

Boston, Aug. 27.—The retail price of Everett by-product coke has been advanced $1 a ton, to $14.50, delivered. This brings the price into line with that quoted by the Providence producer. The Everett company is said to be considerably behind on deliveries and Providence is well booked ahead on orders. Prices are tending upward, with first grades of foundry coke quoted around $5.75 to $6.25 and others at $5.25 to $5.50, to which is added $5.55 freight.

Market More Active

Cincinnati, Aug. 28.—Active demand and stiffening of prices characterizes the local coke market. The largest transaction of the week was the sale of 200 tons of foundry coke to an Indian melter. A user in Louisville, Ky., is inquiring for 150 tons of Wise county foundry coke for prompt delivery. Despite the stiffening in Connellsville coke prices, there appears a slight weakening in Wise county fuel. The foundry grade is quotable at $6.50 to $7, ovens, as compared with $7 to $7.50 a week ago. The furnace fuel, also is down on an average of 50 cents a ton. Sellers are unable to account for this condition. Some say that it is due to over production, while others contend that the demand has eased off considerably. The movement of New River coke has slowed up, while Pocahontas coke is not a factor in the present market.

St. Louis Trade Quiet

St. Louis, Aug. 27.—While the demand for industrial and domestic coke has shown some improvement, the situation generally continues quiet. Users of foundry coke apparently are well supplied for current requirements, and are not disposed to buy far into the future.

Demand Improved at Detroit

Detroit, Aug. 28.—Producers of by-product coke say that a decided improvement in demand has appeared in recent weeks. Orders on books of the largest producer are far ahead of production. Prices are unchanged at $12, ovens. It was believed that a change in price would come after Sept. 1, but producers say conditions now do not warrant it.

Southern Market Weak

Birmingham, Ala., Aug. 27.—The coke market in the Birmingham district shows continued weakness. Foundries are watching the coke market but are not buying. Quotations continue around $8 per ton for foundry coke. No change is noted in the rate of coke production.

Sales at Chicago

Chicago, Aug. 28.—Coke sales are heavy, on account of strike fears. Beehive is quoted $10.16, delivered. There is no change in the price of by-product.

Sales Still Are Moderate

(*Continued from Page 569*)

in the Birmingham district are larger. The Sloss-Sheffield Steel & Iron Co. has seven blast furnaces in blast, Woodward Iron Co., four, Alabama and Republic two each, Central one, and Tennessee Coal, Iron & Railroad Co., seven on basic and three on foundry iron.

Prices Stepped Down

Cleveland, Aug. 28.—Sales of pig iron by four of the interests represented in the northern Ohio group, with headquarters here, have totaled over 100,000 their price from $26 to $25.50, furnace, for local delivery, while out in the state $24.50, Cleveland, has been done. More iron has been sold on a basis of $24.50, valley. A lake furnace interest frankly admits having no price, except that dictated at the time by circumstances. Three sales of 1000-ton lots of basic have been closed in the week, two in western Pennsylvania, and one in eastern Ohio, and some additional tonnages have been figured on. It is reported that $25, valley, was the price on the three sales. A leading maker anxious for tonnage is known to have bid $25, valley, but failed to close. Several large users of foundry iron have been in the market Inquiry is relatively small and none is for over 500 tons. The largest sale is of 1500 tons of foundry iron to a New England melter. Low phosphorus iron is dull and unchanged.

Tariff Trip Is Delayed

Washington, Aug. 28.—Members of the metals division of the tariff commission who had expected to leave for Europe, Aug. 15, to ascertain pig iron production costs there cannot now leave before late September at the earliest because members of the commission will not meet again before Sept. 15 and the

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Aug. 29, 1923	July 1923	May 1923	August 1922
PIG IRON				
Bessemer, valley del. Pitts....	$28.27	28.52	32.07	29.16
Basic, valley	25.00	25.15	29.80	27.96
Basic, eastern del., eastern Pa...	25.10	27.25	30.75	29.50
*No. 2 foundry, del. Pitts.....	26.27	27.37	31.91	32.76
*No. 2 foundry, Chicago.....	27.00	28.00	32.50	28.60
*Southern No. 2, Birmingham..	23.50	25.00	27.00	20.70
*Southern Ohio, No. 2, Ironton..	26.00	26.50	31.00	27.00
**No. 2X, Virginia furnace ...	26.50	27.25	28.60	26.00
***No. 2X, Eastern del., Phila	26.26	28.00	32.76	32.15
Malleable, valley	24.50	25.50	30.20	28.60
Malleable, Chicago	27.00	28.00	32.50	28.60
Lake Superior charcoal, Chicago	32.04	36.65	36.65	33.75
Gray forge, val. del. Pittsburgh	26.27	27.02	31.17	30.16
Ferromanganese, del. Pitts....	122.29	122.79	129.79	72.29
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	42.50	42.50	45.40	35.00
Sheet bars, open-hearth, Pitts....	42.50	42.50	45.40	35.00
Billets, bessemer, Pittsburgh....	42.50	42.50	45.00	35.00
Billets, open-hearth, Pittsburgh..	42.50	42.50	45.00	35.00
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	1.80
Steel bars, Chicago	2.50	2.50	2.50	1.88
Steel bars, Philadelphia.....	2.72	2.72	2.77	2.275

*1.75 to 2.25 silicon. *2.25 to 2.75 silicon

	Aug. 29 1923	July 1923	May 1923	August 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.72	2.72	2.82	2.125
Iron bars, Chicago mills	2.50	2.55	2.60	1.98
Beams, Pittsburgh	2.50	2.50	2.50	1.80
Beams, Philadelphia	2.82	2.82	2.87	2.325
Beams, Chicago	2.60	2.60	2.60	1.90
Tank plates, Pittsburgh	2.50	2.50	2.50	1.80
Tank plates, Philadelphia	2.82	2.82	2.92	2.325
Tank plates, Chicago	2.60	2.60	2.60	1.90
Sheets, blk., No. 28, Pittsburgh.	3.85	3.85	3.85	3.25
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	3.00	2.45
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	5.00	4.25
Wire nails, Pittsburgh	3.00	3.00	3.00	2.40
COKE				
Connellsville furnace.....	5.00	4.35	5.10	13.20
Connellsville foundry, ovens.....	5.50	5.15	6.10	14.30
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	18.50**	18.25	22.20	17.10
Heavy melting steel, eastern Pa..	16.00	17.25	20.40	15.25
Heavy melting steel, Chicago....	16.25	17.12	19.75	15.80
No. 1 wrought, eastern Pa....	17.50	18.85	24.40	18.25
No. 1 wrought, Chicago.....	17.50	16.62	19.95	16.35
Rails for rolling, Chicago.....	17.75	18.37	21.80	16.75

**Should have been $18 instead of $17 last week.

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

August 29, 1923	August 22, 1923	July, 1923	May, 1923	August, 1922	August, 1913
$44.84	$44.84	$45.39	$47.52	$39.79	$25.97

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

tons this month. One interest has closed for 35,000 tons as compared with 50,000 tons in July. Bookings do not come up to shipments, except in the case of one maker who reports that with him they have been slightly in excess. Sales during the past week total around 25,000 tons for the four interests. There are some indications that buying is about to begin in much larger volume, as melters' stocks are low and there is a good run of inquiry. Generally unsatisfactory conditions, however, are indicated by the fact that in pracally all areas served by the northern Ohio group prices have been stepped down during the week 50 cents to $1 a ton. A large merchant interest has reduced its quotation from $26 to $25, valley, and at Buffalo, and would probably do less than $26 at Ironton. Cleveland makers have dropped this week, including electric manufacturing and radiator interests. One inquiry pending is for 4000 tons. Another for 3000 tons has been closed. A third, including 1200 tons for a Pennsylvania plant and 800 tons for Cleveland also has been placed.

Eastern Sales Small

Philadelphia, Aug. 28.—Buying of pig iron still is hand-to-mouth. Most sales are confined to 200-ton lots or less. Sales of 20,000 tons were made in the past week, mostly foundry iron. Melters are taking only what they need. Some producers are selling only to regular customers and are not seeking business. The price is firmer at $25. One furnace quotes $25.50. No fourth quarter quotations are out. Freight equalizing is not being done.

necessary authorization was not made prior to adjournment. As one effect indefinite delay will result in getting action on the complaint of the eastern pig iron producers that European pig iron is coming in and that the duty of 75 cents per ton should be increased under the flexible provisions of the Fordney-McCumber tariff act. The commission has announced Oct. 1 as the date for beginning the hearing upon the rates upon various forms of magnesite.

Brick and structural steel plans for a 1-story 600 x 1800-foot foundry for the Ford Motor Co. are being submitted to A. Kahn, architect, 1000 Marquette building, Detroit. Plans are being submitted also for a by-product coal plant for the Ford Motor Co.

Iron and Steel Prices

SCRAP PRICES, PAGE 636, WAREHOUSE PAGE 628 ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 632

Pig Iron

Bessemer, valley	$26.50
Bessemer, Pittsburgh	28.27
Basic, valley	25.00
Basic, Pittsburgh	26.77
Basic, Buffalo	24.00 to 24.50
Basic, del. eastern Pa.	25.00 to 25.25
Malleable, valley	24.50 to 26.00
Malleable, Pittsburgh	26.27 to 27.77
Malleable, Chicago	27.00 to 27.50
Malleable, Buffalo	25.00
Malleable, del., eastern Pa.	26.25 to 26.75

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	26.76
No. 1X, Buffalo	26.50
No. 2 foundry, valley	25.00
No. 2 foundry, Pittsburgh	26.27 to 27.77
No. 2 foundry, Buffalo	25.00
No. 2 foundry, Chicago	27.00 to 27.50
No. 2 foundry, Granite City	27.50 to 28.00
No. 2 foundry, Ironton fur.	26.00
No. 2 foundry, Cleveland del.	26.00
No. 2, foundry del. Phila.	25.76
No. 2 foundry, N. J. tidewater	26.13 to 26.76
No. 2X, eastern del., Phila.	26.26
No. 2X, east. N. J. tidewater	26.63 to 27.26
No. 2X, eastern del. Boston	29.15 to 29.65
No. 2X foundry, Buffalo, fur.	25.50
No. 2X, Buffalo, del. Boston	29.91 to 30.41
No. 2 southern, Birmingham	24.00 to 27.00
No. 2 southern, Cincinnati	27.55 to 31.05
No. 2 southern, Chicago	29.51 to 30.01
No. 2 southern, Philadelphia	30.30 to 30.80
No. 2 southern, Cleveland	29.51 to 30.01
No. 2 southern, Boston (rail and water)	30.41 to 30.91
No. 2 southern, St. Louis	28.67 to 29.17
No. 2X, Virginia furnace	26.25 to 26.50
No. 2X, Virginia, Phila.	31.52 to 31.77
No. 2X, Virginia, Jersey City	31.79 to 32.04
No. 2X, Virginia, Boston	32.17 to 32.42
Gray forge, eastern Pa.	25.00 to 25.25
Gray forge, val. del., Pitts.	26.27
Low phos., standard, valley	32.00
Low phos., standard, Phila.	32.79
Low phos., Lebanon furnace	32.00 to 33.00
Charcoal, Birmingham	34.00
Charcoal, Superior, Chicago.	32.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent	$33.00
8 to 9 per cent	34.50
9 to 10 per cent	36.50
10 to 11 per cent	38.50
11 to 12 per cent	41.00
12 per cent	43.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$43.50
11 to 12 per cent	46.00
12 to 13 per cent	48.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$112.50 to 117.50
Ferromanganese, delivered, Pittsburgh	117.79 to 122.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	45.00 to 47.50
Ferrosilicon, 50 per cent contract freight allowed	82.50 to 87.50
Ferrotungsten standard, per pound contained	88.00 to 90.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.50
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$5.00 to 5.50
Connellsville foundry	5.50 to 6.50
New River furnace	8.00 to 9.00
New River foundry	11.00 to 11.50
Wise county furnace	5.25 to 6.25
Wise county foundry	6.50 to 7.00
Alabama furnace	7.00 to 7.50
Alabama foundry	7.50 to 8.00

By-Product

Foundry, Newark, N. J., del.	$11.34 to 11.41
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill.	13.00
Foundry, Alabama	7.75 to 8.50

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Open-hearth, Philadelphia	45.17 to 47.17
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50
Forging, Pittsburgh	47.50
Forging, Philadelphia	53.67 to 55.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$42.50
Youngstown	42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00

Standard extras, $2.50 per ton over ¼ inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.40c to 2.45c
Universal skelp, Pittsburgh	2.40c to 2.45c
Sheared skelp, Pittsburgh	2.40c to 2.45c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.72c to 2.82c
Structural shapes, New York	2.74c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.82c
Tank plates, New York	2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c to 2.74c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Reinforcing bars, Pittsburgh	2.30c to 2.40c
Bar iron, common, Phila.	2.72c
Bar iron, common, New York	2.74c
Bar iron, common, Chicago	2.40c to 2.45c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.15c
Hoops, Pittsburgh, small	3.50c
Bands, Pittsburgh	3.15c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.62

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 35.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.50c to 3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples Pittsburgh	3.45c
Galvanized staples Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.15c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c
No. 28 bessemer, Pittsburgh	5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	63.20 to 65.20
Six-inch and over, Chicago	59.20 to 61.20
Three-inch, Birmingham	59.00 to 60.00
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	66.50 to 67.50
Six-inch and over, New York	62.60 to 63.30

Standard fittings, Birmingham, base..$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Advance Continues

Only Fair Amount of Sales Are Reported—Further Price Advances Expected Since Stocks Among Consumers Are Low

SCRAP PRICES, PAGE 636

Chicago, Aug. 28.—An order for 20,000 tons of heavy melting steel from one of the local steel companies early in the week was the signal for a buying movement which has spread rapidly to include nearly all western districts. Practically all grades of scrap have been represented in the recent trading. The 20,000-ton order for heavy melting steel was placed at $16. Dealers are now covheavy sales of heavy melting steel are ering at $16.50 for this grade. Two other reported, one for 8000 and one for 5000 tons. A Milwaukee manufacturer took 500 tons of low-phos. Cast scrap has moved freely in small lots, the total for the week being estimated in excess of 3000 tons. Scrap has suddenly become scarce due to the unexpected heavy buying and in part to a car shortage, a result of railroads diverting many cars to the bituminous fields. Most grades have advanced 50 cents. No reductions are reported. Railroad offerings are heavy and include 7000 tons for the Burlington, 1500 tons for the Chicago, Milwaukee & St. Paul and 1500 tons for the Chicago & Alton.

Small Business Moving

Boston, Aug. 28.—The scrap iron and steel market in New England is in a listless condition at present, with relatively small business moving and prices holding at stable levels. Some dealers are looking for a rise in prices if there is a quickening in activity, but other interests expect prices simply to hold steady. There is no expectation of any serious declines taking place at this time. The situation seems to be just about a stand-off at present, with no large tonnage offered by dealers and no large tonnage being forced on the market for them to purchase. Local melters are said to be taking little metal. Dealers have been fairly active in covering short sales which were made a month ago. It is reported that Pennsylvania interests have paid a price of $11.50 for heavy melting steel, but the local market is willing to pay as high as $12.50, delivered here. Stove plate, delivered to consumers, is quoted at $16.50 to $17. Cast-iron borings appear to be somewhat easier, at $8.50 to $9, and machine shop turnings are quoted at the same price. Opinion is mixed as to when buying will expand, some looking for a turn after Labor Day, while others expect the market to be quiet for the remainder of the year, the latter basing their opinions on the statement that the mills are overstocked.

Steadiness Features Market

New York, Aug. 28.—Steadiness again features the local iron and steel scrap market, although two or three changes holding at $11.50 to $12, New York, have been noted. Wrought pipe is higher, and turnings are up a half dollar, at a range of $10 to $10.50. Rerolling rails, on the other hand, have been marked down, dealers offering $14 to $14.50. The remainder of the list, however, is virtually unchanged, with the leading grades, such as heavy melting steel and cast scrap, holding firmly at last week's levels. The leading eastern Pennsylvania consumers of heavy melting and No. 1 railroad steel are still paying $16, delivered, for the better grade, with buying of a hand-to-mouth character. Rolling mill demand remains exceedingly light.

Improvement Is Noted

Philadelphia, Aug. 28.—Some improvement is noted in the buying of wrought pipe, borings and turnings and cast scrap, but steel grades are moving slowly and are deadlocked. Mills are refusing to raise offers to dealers who are not selling short or buying long until the general movement of the steel market is shown. Stocks of both consumers and dealers are small but many producers are holding accumulations for a better market. The sale of 500 tons of heavy melting steel at $16.50, delivered, is reported. Foundries as a rule are buying better. A canvass of the steel mills indicates that order books are filled only a month ahead.

Activity of Fair Proportions

Pittsburgh, Aug. 28.—Only a fair amount of activity is noted in connection with scrap. An independent steel company here purchased about 2000 tons of heavy melting steel at $18.50 and a West Virginia steel company likewise closed on a small amount at a similar figure. Dealers, however, have paid as high as $19 to cover shorts, making the market quotable at $18.50 to $19. The purchase of 500 to 1000 tons of heavy breakable cast at $19.50 raises that market by 50 cents. Since a local refined iron bar market closed on 2000 or 3000 tons of No. 1 coupola cast, paying $21.50, the market has advanced on smaller sales at $22 to $22.50. In connection with specialties, sales being noted of one, two or three carloads at a time among dealers short on orders, as high as $23 has been paid, particularly for knuckles and couplers. No mill has paid higher than $21.50 to $22. A small movement of sheet scrap too is noted and several small sales of turnings, both axle and shovel, have been closed. These sales have set the market on each of these commodities at 50 cents higher than one week ago. The market is considered fairly strong and further advances are expected since stocks among consumers are low and need replacement. When several buyers come into the market at one time, it usually is the signal for higher prices on the strength of demand.

Market Continues Firm

Detroit, Aug. 28.—The scrap market continues firm with dealers finding it difficult to complete orders on some grades, especially borings and turnings and good heavy meltling steel. Prices are ruling about 75 cents higher on all grades, with heavy cast and malleable up as much as $2 a ton. Inquiry is wider at the outset of this week. Dealers in western Michigan cities, who deal almost exclusively with the Chicago market have entered this field and overbid local dealers for some supplies of good material. Some dealers regard the present strength in scrap as a flurry while others regard it as an indication that mills are practically out of good scrap and the market will be active for several months at least. Producers are disinclined to sell on this rise in the market.

Sentiment Considerably Firmer

St. Louis, Aug. 27.—Sentiment in the scrap iron and steel market, especially among dealers, is considerably firmer than has been the case during the past few months. Prices on certain grades have developed an upward tendency, and throughout the list declines have for the time being definitely halted. While not increasing their commitments to any appreciable extent, the industries are displaying more interest, several of the leading consumers having put out quiet feelers with the view of ascertaining information relative to available supplies and prices. The American Car & Foundry Co., which has bought virtually nothing for three months, is asking for prices on suitable grades, and there are signs of life among users of rails for rolling.

Several fundamental conditions are contributing to the present firmness, chief among which is depleted stock in consumers hands. Several of the mills have booked good orders for their products, on which they have not covered in the scrap market. No scrap is coming in from the country, and country dealers have little or nothing on hand. With present prices and freight rates it would be necessary to purchase scrap for next to nothing in order to prepare it and ship to this market without loss. Another bullish symptom is that on all sales made to consumers requests are being made for rush shipment, indicating that the material is urgently needed.

Dealers are buying freely for laying down in their yards, and all recent railroad lists have been easily absorbed. Some of this buying is on the theory that should an anthracite coal strike take place, freight cars will be sent in large numbers to the east, leaving this region short of equipment for handling scrap when the demand is at its height this fall. The carriers still are offering freely, the two main lists out being Chicago, Burlington & Quincy, 5000 tons; Louisville & Nashville, 11,000 tons, including 3200 tons of No. 1 scrap rail. Chicago, Milwaukee & St. Paul, 1200 tons; St. Louis Terminal Railway association, 1400 tons and an open list by the Big Four. The Standard Oil Co. from Woodriver is offering 260 tons.

Southern Buying Still Light

Birmingham, Ala., Aug. 27.—Scrap iron and steel still is moving in this district but mostly on old orders as the tonnage being booked is on the wane at a rapid pace. The market, so far as the buying is concerned, is negligible, foundries buying a little to tide them over. Some of the foundries have a little stock of old material on the yards and are not concerned about being able to get scrap when needed. All quotations are weak. The dealers still insist on bringing in as much scrap as they are moving out. There is a heavy tonnage of railroad scrap in sight, more than has been seen in many years. Rebuilding

and discarding of equipment have brought about an accumulation of scrap that railroads are finding some difficulty in disposing of.

Ferromanganese

Market Is Inactive—Spot Spiegeleisen In Demand

FERROALLOY PRICES, PAGE 571

New York, Aug. 28.— Spiegeleisen is fairly well sold through the remainder of the year and makers and consumers are in a comfortable position. Some contracts are about to expire and productive capacity is being reserved for renewal of these contracts. Not much spiegel is left for 1923 selling but there is good demand for spot material in small lots. The price is firm at $45, furnace for 19 to 21 per cent and $44, furnace, for 16 to 19 per cent, in lots of 100 tons or less. Ferromanganese is quoted at $117.50, seaboard, but is inactive.

Only Small Lots Move

Pittsburgh, Aug. 28.—Continued dullness marks the ferroalloys market although surveys among users reveal conditions which indicate that buying probably will have to be done prior to the end of September.

Occasionally a carload sale of ferromanganese is noted, such as one to a Utah user involving 2700 tons consumated this past week at $117.50, furnace. Sales and inquiries generally, however, are lacking, even those interests having resale ferromanganese to offer report no activity. Prices on the latter sometimes are $5 lower than the $117.50, furnace or seaboard base figure prevailing on new material. Activity in connection with other alloys is exceedingly spasmodic. One large interest here put out an inquiry for 60,000 pounds of ferrochrome on which domestic producers quoted 12c. The buyer announced that it would close at a lower figure and it is understood that foreign material held in this country still is being offered at 11½c. One sale of 250 tons of chrome ore is noted at $21.

One interest reports disposing of 2000 pounds of ferrovanadium recently at $3.50, which transaction interrupted a long period of quietness in that commodity. Spiegeleisen is unchanged; new demand still halts and while a few inquiries have been issued buying is deferred. Prices by the leading producer still are $45 to $47.50, furnace, on 19 to 21 per cent material, and $44 to $46.50 on the 16 to 19 per cent grade. Another seller about to produce this material is quoting $45 furnace, on 18 to 22 per cent spiegeleisen.

Prices Unchanged

Buffalo, Aug. 28.—Prices of the special ferroalloys are unchanged. Business is quiet in practically all lines, some being slightly better in August than in July, others slightly slower. An inquiry for 25,000 pounds of ferrotungsten is the only inquiry for manufactured tungsten of note reported this week. A small lot of tungsten powder sold at $1 a pound. Sales of 50 per cent ferrosilicon are reported at $85, delivered.

Sheet Bar Tonnage Is Sold

Price of $42.50 Applies on New Business in Northern Ohio District —More Figuring in Progress—Forging Billets Wanted

SEMIFINISHED STEEL PRICES, PAGE 571

Cleveland, Aug. 28.—The price of sheet bars has been more clearly defined by the sale of a good tonnage for prompt delivery to a large consumer at $42.50, mill. The market is firm at this figure. Some users are low on stocks and more figuring is being done, but business in the open market generally is light. More reservations have been made for the fourth quarter at the going prices at time of delivery. There is a better inquiry for moderate lots of forging billets, which are held at $47.50.

Few Inquiries Now Appearing

Pittsburgh, Aug. 28.—While quietness still characterizes the semifinished market, inquiries for billets are beginning to appear. One middle interest has issued an inquiry for 1000 tons of soft slabs and 1000 tons of high carbon slabs. Most sheet bar users are under contract and regular shipments are being made to them. Efforts to dislodge the $42.50 base Pittsburgh, price on sheet bars, billets and slabs so far have failed. Producers state they cannot shade that price and many buyers will not pay that much. No inquiries now are current for forging billets which are priced at $47.50. A few wire rod inquiries involving 1000 to 2500 tons each are going the rounds. Producers are well filled up with wire rod business for all of their excess; the base is unchanged at $51, Pittsburgh. Skelp, except to regular customers of several sellers, is not moving. The Allegheny Steel Co. is understood recently to have purchased a tonnage from its regular source of supply. The price is unchanged at 2.40c, base Pittsburgh.

Market Still Quiet

Youngstown, O., Aug. 28.—No sales of billets, slabs or sheet bars are pending in this district and the market likely will continue to drag along until the time is opportune to conduct negotiations for last quarter tonnage. Meanwhile producers have their attention focused on the shipments. While sheet bar specifications issued a week ago fell short of expectations the volume released this week was on a much broader scale. Producers have no slant on semifinished prices that are to rule on next quarter shipments but the trade does not anticipate having to pay more than $42.50, Youngstown, that has applied on business throughout this quarter.

Eastern Market Quiet

Philadelphia, Aug. 28.—Rerolling billets are dull at $42.50. Forging billets are $47.50 to $50. Demand is small. Wire rods are quiet, but tonnages are specified fully. Rods have not yet been sold for the fourth quarter.

Strip Is Improved

STRIP PRICES, PAGE 571

Pittsburgh, Aug. 28.—Considerable improvement has been enjoyed by makers of strip steel during the past two weeks. Specifications have increased and new buying, too, is better. For one prominent maker here, August bookings up to Saturday, Aug. 25, exceeded July's by about 40 per cent. The betterment applies both to hot and cold-rolled strips, with the balance slightly in favor of the latter. This business comes from a widely distributed clientele in different lines of manufacture, not alone automotive, although agricultural implement buying has been exceedingly light. Market prices are unchanged at 3.15c, base Pittsburgh, for hot rolled and 5.00c, base Pittsburgh, for cold.

Wire Products

Booked in Large Quantities—Jobbers and Users Buying

WIRE PRICES, PAGE 571

Pittsburgh, Aug. 28.—Daily order receipts in connection with wire products are on the increase. Jobbers and users are contributing more as makers' books are being cleared of obligations opening the way for further bookings. Hitherto deliveries were far deferred because of the heavy order books. Since shipments have continued in excess of new business, progress has been made in the discharge of orders. The outlook continues particularly bright in connection with nails and wire, and while some interests have not taken any new bright wire business since last January, they are about to accept some business for the last quarter. Barbed wire, galvanized wire and fencing too, are showing improvement and mixed carload orders are expected to become more numerous next month. Prices are unchanged at 2.75c, base Pittsburgh, for plain wire and 3.00c for wire nails.

Nail Demand Continues

New York, Aug. 28.—While no features present themselves in the wire and nail market, demand continues good, deliveries still are extended and prices are steady. Consumers are in need of their material and are seeking earlier deliveries than mills can make. Nails are quoted at 3.0c, Pittsburgh, or 3.34c, delivered, New York.

Eastern Demand Good

Philadelphia, Aug. 28.—Wire demand and sales continue good. Prices are unchanged. Delivery still is deferred.

Jobbers Take More Nails

Chicago, Aug. 28.—The jobbers' demand for nails in Chicago and in other industrial centers throughout the Middle West has improved slightly during the past week. Consumers in Michigan, Ohio and Indiana have been heavy buyers. This has been partly offset, however, by a slackening up in the country demand throughout the states west of the Mississippi. Deliveries are practically caught up on barbed wire and netting.

Bar Market Holds Steady

Sales Continue at About Same Level—Mills Not Building Up Backlogs—Price Steady at 2.40c

BAR PRICES, PAGE 571

Chicago, Aug. 28.—Soft steel bar trade continues to improve. Sales during the past week totaled from 10 to 20 per cent above the total of the previous week according to the leading sellers. One of the principal mills reports inquiry at the present time the heaviest in two months. Railroads are again coming into the market and several round tonnage inquiries are from this source. Buying is well diversified and considerable interest attaches to new inquiry from farm implement manufacturers. A frog and switch manufacturer bought 5000 tons of bars. Prices are 2.50c to 2.60c with prompt delivery commanding premiums.

Bar iron sales continue at practically the same level which has held throughout the past six weeks. Mills are not building up backlogs but current business is sufficient to keep operations steady. The price is 2.40c for large tonnages and 2.45c for small orders.

The rail steel bar market has shown better strength during the past week than heretofore in August. The price of 2.30c holds remarkably firm in view of the dullness of the past few weeks. Inquiry at present is more encouraging than at any time since early in July.

No Change in Conditions

Cleveland, Aug. 28.—With prices firm at 2.40c, Pittsburgh, the bar market in this district remains unchanged. A fair volume of buying is coming through regularly from the usual consumers of this material but no unusual demand from any quarter is apparent. It is believed automobile builders are having some difficulty in estimating their future demands. Makers of low-priced cars, whose factories have been breaking production records recently in past months have underestimated their requirements and now are proceeding cautiously on last quarter commitments. Plants of producers of automobile accessories apparently are working at capacity and these interests are taking tonnage regularly from the bar mills.

Market Remains Quiet

Boston, Aug. 28.—Business in steel bars was a little quieter than usual during the past week, but dealers did not attribute the slackening in orders to anything more than a seasonal condition. Prices were unchanged at 2.40c, Pittsburgh, the figure which has prevailed for the past two months.

Specifications Freely Furnished

Pittsburgh, Aug. 28.—Interest in hot-rolled merchant steel bars largely is being furnished by the cold-drawn trade which is furnishing regular specifications. Some interests have placed specifications for their September allotments and already have intimated what their October consumption will approximate. Other consuming lines are not absorbing so much tonnage but each is furnishing a fair number of small tonnages from a carload up. New inquiries for merchant steel bars are on the increase involving 50 to 500 tons at a time, one being issued last week for 300 tons of one size. The price is firm at 2.40c, base Pittsburgh. On refined iron bars, the situation largely is unchanged. The movement of the material shows slight acceleration and prices are firm at 3.25c to 5.00c. Low-phosphorus melting bars now are bringing 4.60c instead of 4.05c, base Pittsburgh, as was the case for many weeks.

Bar Demand Is Steady

New York, Aug. 28.—Steel bars are in steady demand from a wide variety of sources and the price holds strong at 2.40c, Pittsburgh. Consumers are taking their full quotas and in many cases are seeking anticipation of shipment. The general sentiment is that prices are likely to be advanced in the fall, to absorb some of the added cost of production due to the 8-hour day, consumers holding this idea in common with producers.

Expect Price Increases

Buffalo, Aug. 28.—There is no hint of any weakening in steel bar prices and demand is good. The 2.40c, Pittsburgh, price is firm and both buyers and sellers regard any forthcoming change as an advancement rather than a reduction.

Cold Drawn Buying Good

Pittsburgh, Aug. 28.—Order books continue heavy in the cold-drawn bar industry although August bookings were light as compared with other months. Tonnage still is as diversified as ever, going chiefly to the automotive industry. While an occasional order has been placed by agricultural implement interests, local producers of cold-drawn steel find this character of trading light. Deliveries are much deferred, particularly on the smaller sizes which cannot be had nearer than six or eight weeks. Typical orders run from a carload up to 200 or 300 tons at a time, omitting less than carload buying. The price is reported firm at 3.25c, base Pittsburgh.

Expect New Rivet Price Effective Sept. 1

Pittsburgh, Aug. 28.—The trade still awaits the announcement of a new base price on structural rivets due Sept. 1, upon which a 20-cent extra will apply for cone head rivets instead of 10 cents as hitherto. No change is expected, hence the price probably will be 3.25c, base Pittsburgh, although of late, concessions under that on attractive business have carried prices as low as 3.00c, base Pittsburgh. Carload orders for rivets have run up to a fair aggregate of late although railroad buying has not come up to expectations. In the opinion of the trade, inquiries from the railroads are not as large as they should be at this time of the year. In connection with bolts, while there has not been a general adoption of lower prices, the market is weak. As usual under a slackened demand, lower prices are being named on what business is being closed up. This business has been on the basis of 60 and 5 off for large machine bolts instead of 50, 10 and 10 off, and 60, 10 and 5 off on small machine bolts instead of 60 and 10 off. It is understood that the new discounts are being more widely adopted this week. Nuts are comparatively firm on the basis of $3.75 off list.

Fall Buying Starts

Chicago, Aug. 28.— Bolts and nuts have been in strong demand during the past week and what is thought to be the start of buying for fall stocks is under way. One of the principal sellers reports actual bookings during the last five days heavier than for any similar time in more than two months. A large proportion of the orders have been for small lots coming from well scattered dealers throughout the West. The demand from large manufacturers also shows improvement. Prices are unchanged.

Rivet Demand Falls

Cleveland, Aug. 28.—Demand for rivets has fallen off considerably during the past two weeks. However, makers feel that this is only a temporary condition and that the market will pick up soon. Prices have been reduced from 3.25c to 335c to a level of 3.00c to 3.10c and now are holding firm at the latter quotation. Demand for nuts and bolts is holding at an exceedingly satisfactory rate, the total for August being the record for the past several months. To meet competition several companies have placed in effect a reduction of 5 per cent on nuts and bolts. The list prices are being equalized to line up with new bar extras and equalize bolt and nut sizes, which for some time have been out of line. It is understood that the list is now being prepared and will be mailed to the trade before Sept. 1.

Hoop Inquiries Are Fair

Pittsburgh, Aug. 28.—Barrel and keg makers at present are not furnishing much of the tonnage being placed upon the order books of the hoop and band makers. The majority of present orders comes from the automotive industry, chiefly parts makers such as rim manufacturers, etc. Old obligations fast are being discharged, leaving room for bookings of new orders, which is gaining impetus slightly. New inquiries are fair and the present market price, 3.15c base Pittsburgh, is firm.

Demand for Warehouse Material Good

New York, Aug. 28.—With the exception of a change in the price of machine bolts by a leading interest, who is now quoting 45 and 5 off list, as against 40 off recently, the local warehouse market is unchanged. In fact, leading jobbers look for little revision in the prices of any of the leading descriptions for some time. While business is apparently being

maintained at the somewhat improved rate over last month, the market cannot be described as particularly active. Shapes and bars remain in outstanding demand.

Prices Still Firm

Chicago, Aug. 28.—Iron and steel warehouse trade fell off slightly some days ago, but now appears to be recovering. Prices hold firm and the fuel situation combined with the shorter shift plans of steel companies points toward higher rather than lower future prices. One of the principal Chicago houses is much less anxious for new business because of a feeling that prices will be advanced. Demand for concrete bars and structural shapes continues good.

Expect Buying Movement

Cleveland, Aug. 28.—Demand for warehouse stocks has increased since the first of the month, the demand applying to all lines and especially to materials used by the building trades. Consumers' stocks are low and a general rush is expected when the buying movement starts. Prices remain unchanged.

Rivet Demand Heavier

Detroit, Aug. 28.—Dealers in warehouse iron and steel report an unusual demand for rivets and structural steel shapes. Demand for the latter has been growing for the past two weeks. Heavier inquiry for rivets was due to prospective new prices on extras to go into effect Sept. 1. The large amount of small store remodeling and similar building has occasioned large tonnage in structural steel. Sheets are extremely slow. Bands and hot and cold-rolled bars are in fair demand. Dealers report no change in prices.

Less Ore Consumed

Cleveland, Aug. 28.—Consumption of Lake Superior iron ore in July decreased 68,783 tons from June, the Lake Superior Iron Ore association states. The following reports the tonnages consumed, and amounts on dock:

	Tons
Ore consumed in June	5,816,139
Ore consumed in July	5,747,356
Decrease in July	68,783
Ore consumed in July, 1922	3,582,715
Ore on hand at furnaces Aug. 1, 1923	22,546,777
Ore on Lake Erie docks Aug. 1, 1923	4,956,705
Total at furnaces and Lake Erie docks Aug. 1, 1923	27,503,482
Total at furnaces and Lake Erie docks Aug. 1, 1922	31,127,303

Ore Imports Recover

Philadelphia, Aug. 28.—Imports of iron ore for the week ended Aug. 25 recovered somewhat, with a total of 23,518 tons being brought into this port as compared to 21,951 for the week preceding. Of the 23,518-ton total, 7038 tons came from Sweden, 880 tons from Germany, 7500 tons from Cuba, and 8100 tons from French West Africa. Besides the iron ore, 5657 tons of manganese ore was imported from British West Africa, 1014 tons of pig iron from British India, and 200 tons of ferromanganese from England.

Tank Plates Are Active

Unusually Heavy Demand Comes Out at Chicago—Standard Oil Inquiring for 9000 Tons—Prices Remain Firm

PLATE PRICES, PAGE 571

New York, Aug. 28.—After obtaining prices on 30 storage oil tanks of 80,000 barrels capacity, involving 9000 tons of plates and 1000 tons, of structurals, the Standard Oil Co. of New Jersey is inquiring for this tonnage of plain material in this market, with the suggestion that unless better than 2.50c, Pittsburgh, can be done the steel will not be bought. This appears to be an effort to break the market, which is holding firmly at this level. As a result a number of mills are not interested in this business and do not expect it to be placed. Inquiry for plates is in a multitude of small tonnages representing a wide demand. Mill representatives here have found the past week has brought them as much business as any two weeks in recent months and one has sold more in the past ten days than in the entire month of July. An important tank maker has sufficient orders for the next four months and is not seeking more business at this time. Tank inquiry as a rule is fairly light, plate tonnages now going into other uses.

Tanks Take 50,000 Tons

Chicago, Aug. 28.—Demand for plates for oil tank construction is unusually heavy at present. One producer reports 50,000 tons up for figure. This is divided between the Texas field, California district and Mexico. One Pacific coast company is asking for 6000 tons. Local boiler and tank makers have recently placed fairly substantial orders for plates. Automobile manufacturers also have bought. Railroads continue to take a fairly large tonnage for car repairs. Mills still are pressed for shipments and deliveries are from three to five months behind. Prices are firm at 2.60c for future delivery with prompt tonnage commanding fully 2.80c.

Eastern Sales More Active

Philadelphia, Aug. 28.—Plate demand is better from ship and tank builders, car repairers and general users. The Pennsylvania railroad is accepting shipments. Sales are already for three to four weeks delivery. The price is firm at 2.50c. It is believed the Standard Oil Co., with an inquiry for 9000 tons for storage tanks, could shade this a trifle.

Fair Business in Sight

Cleveland, Aug. 28.—Plates are strong at from 2.50c to 2.60c, Pittsburgh, depending upon delivery. The lower price is generally understood to cover deliveries from three to five months. Prompt shipment of material can be made by a number of independent mills, this business going at 2.60c, Pittsburgh, or higher. A number of projects requiring plates have been deferred, but orders for small tonnage continue to be received in fair volume.

Inquiry Is For 20,000 Tons

Pittsburgh, Aug. 28.—Approximately 20,000 tons is the aggregate tonnage involved in current plate inquiries. This includes something like 12,000 to 14,000 tons of oil storage tank work pending for two or three weeks past, delayed in placing because of the price situation as regards crude oil and gasoline. The only tank order of the week as reported by fabricators in this section involves one 37,500-barrel tank for export, requiring 160 tons of plates. Action will be taken about the middle of September on 19 barges for the United States government for use on the rivers involving 3000 to 5000 tons. Railroad car and locomotive work just now is limited, most of the car builders having placed all needed tonnage although from time to time they file their specifications. The market price on plates is firm at 2.50c, base Pittsburgh.

Deny Company Right To Build River Dock

Pittsburgh, Aug. 28.—The application of Jones & Laughlin Steel Corp. for permission to construct a transportation dock along the right bank of the Monongahela river in Pittsburgh has been denied by the state water and power resources board. The board held that the channel has been restricted by fills and other encroachments during the last two years to such an extent as to leave insufficient area to pass large floods without overflow. The board contends that the obstruction would further restrict the channel and have the effect of establishing a precedent. The board also disapproved an application of the Jones & Laughlin corporation for the contruction of an unloading dock along the Ohio river at Woodlawn in Beaver county.

Manganese Ore Irregular

New York, Aug. 28.—More than 20,000 tons of manganese ore from the Caucasus has been sold here in the past week, 38 cents, c.i.f., Atlantic ports being the price. This is 1 to 2 cents per unit under the former level. The market is soft. Indian and Brazilian ores are nominally 42c, Atlantic ports and no offers have been made of late, the market being unusually dull.

A miniature foundry, equipped with a small electric furnace, will be installed in the Milwaukee Vocational School, Seventh and Prairie streets, as a further development of the course of instruction in foundry and machine shop practice. Part of a floor will be rebuilt as a charging floor, bids for this work having been called for Aug. 24, to close Sept. 4. The furnace has not yet been ordered. Archie O. Muehl is secretary of the board of industrial education.

Concrete Inquiry Gains

Chicago Sanitary Commission Work of 6000 Tons Awarded Illinois Steel Co.—Shading Continues General in Quiet Market

REINFORCING BAR PRICES, PAGE 571

Chicago, Aug. 28.—Concrete bar sales in the Chicago district during the past week have fallen slightly below the average for the month of August excluding several large tonnages placed. New York is appearing in good volume and indications point to a marked improvement in orders during September. Prices hold firm at 3 cents for jobs up to 300 or 400 tons. The exceptionally large jobs are being placed at from 2.85c to 2.90c, Chicago warehouse.

The Inland Steel Co. obtained the 6000 tons which has been hanging fire for a month or more for the Chicago Sanitory district work. The Corrugated Bar Co. was awarded 1300 tons for a club house in Milwaukee, but other than these two awards practically nothing over 100 tons has been reported. Work which is in prospect includes 600 tons for a department store at St. Paul, Minn. and an indefinite large tonnage in connection with the Ford Motor Co. development near Minneapolis, Minn.

Bookings Are Unimportant

Pittsburgh, Aug. 28.—Bookings in the concrete bar market are few and far between. The largest, calling for single carloads, are relatively unimportant from a tonnage standpoint. Several jobs involving from 5 to 25 tons apiece have been closed up during the past week, larger projects being held in abeyance. The market price still is unchanged at 2.40c, base Pittsburgh, and on some small work 2.75c is the figure involved. One fabricator recently took a few small jobs upon its quotation of 2.25c, delivered, but this figure was not generally followed and now is understood to be withdrawn.

Few Important Tonnages

New York, Aug. 28.—While reinforcing bars are being sold in a fair aggregate tonnage there are few large lots under consideration and practically all recent sales have been small. Prices are firm on the mill basis, 2.40c, Pittsburgh, while the warehouse quotation of 3.34c, New York, is being shaded freuently to the extent of $3 per ton.

Market Is Featureless

Cleveland, Aug. 28.—The local reinforcing bar market continues to be featureless. Although several large jobs are pending, no awards of size were noted last week, and no new inquiries were brought out that called for more than from 50 to 75 tons each. About 200 tons will be required for the group of three medical buildings for Western Reserve university, bids on which went in this week. A good tonnage is aggregated in small lots of roadwork up for figures. On new steel bars the 2.40c, Pittsburgh, price is firm, as is 2.75c, Pittsburgh, on goods out of stock, although some shading of the latter price is occasionally met. On rerolled bars, 2.30c, mill is the going price, with 2.25c, mill being quoted on favorable business.

CONCRETE CONTRACTS PLACED

Awards this week ..... 9,198 tons
Awards last week ..... 2,952 tons
Awards two weeks ago ..... 2,150 tons

6000 tons, Chicago Sanitary district work, to Illinois Steel Co.
1300 tons, club house at Milwaukee, to Corrugated Bar Co.
700 tons, building for Southern California Gas Co., Los Angeles, to unknown jobber.
300 tons, 6-story building, San Pedro and Winston streets, Los Angeles, to Truscon Steel Co.
270 tons, wharves 232 A and B Los Angeles, Cal., to unknown jobber.
250 tons, building for the United States Rubber Co., Los Angeles, to unknown jobber.
150 tons, Strang warehouse, Brooklyn, N. Y., to Truscon Steel Co.
120 tons, Alameda County Title Insurance building, Oakland, Cal., to Edw. L. Soule Co.
108 tons, Portland cement plant at Manitowoc, Wis., to the Concrete Engineering Co.

CONCRETE CONTRACTS PENDING

600 tons, Golden Rule department store, St. Paul, Minn.; bids opened.
400 tons, school for San Francisco; bids being received.
300 tons, warehouse for Bekins Fireproof Storage Co., San Francisco, general contract to Clinton Construction Co., steel not yet placed.
250 tons, Hall of Justice, Los Angeles; C. J. Kubach Co. low bidder.
200 tons, Evanston, Ill., Sanitary district; bids being taken.
200 tons, three buildings of medical unit of Western Reserve university, Cleveland; bids in.
170 tons, board of public works, Los Angeles; Truscon Steel Co. low bidder.
150 tons, Junior high school building, Ambridge, Pa.; bids close Sept. 6.
130 tons, factory for Nucoa Butter Co., San Francisco; bids being received.
123 tons, Whitewater river bridge, Riverside county, Cal., general contract to Gibbons & Reed.
100 tons, building for the Inependent Towel Supply Co., Pittsburgh; bids being taken.
100 tons, welfare station for Pennsylvania railroad at Altoona, Pa.; bids in Sept. 1.
100 tons, Prescott-White Spar Forest highway, Phoenix, Ariz.; bids in Sept. 11.
100 tons, two bridges for California State highway commission over Pacheco creek and Cedar creek, Santa Clara county; bids in Sept. 11.

Pipe Buying

Still Limited Although Mills Are Comfortably Booked

PIPE PRICES, PAGE 571 AND 632

Pittsburgh, Aug. 28.—Calls for tubular goods on order for long or short periods are more numerous and jobbers everywhere see a fall demand coming for which they wish to be in good shape. In their efforts to collect normal stocks they have been handicapped hitherto by the mills' inability properly to satisfy the large number of customers from week to week.. In some cases, after a period of six or eight weeks of inactivity, the specifications received involve several hundred tons at a time. New line pipe inquiries are scarce although the Ashtabula Gas Co. wanted 30 miles of 10-inch and another gas company 20 miles of the same size. A Mahoning valley pipe maker recently booked an order for 37 miles of 8-inch pipe and from time to time smaller orders of this character are placed. Requests for assorted tonnages of line pipe, oil well casing, gas pipe, etc., from supply houses are numerous. The basing discount of April 19 on standard full weight pipe still is in vogue at 62 per cent off.

Buying Is Progressing

New York, Aug. 28.—Bids will be closed Sept. 7 by the department of water, gas and electricity on 3750 tons of cast-iron pipe and fittings, the pipe to be 6, 8 and 12 inches. The material is to be used for supplies, of which at least 6000 tons, as noted previously are to be purchased in the near future. On 5000 tons for the same department, bids on which went in last week, the Beaver Engineering Co. was low on the general contract, and on another lot of 700 tons, bids on which closed at the same time, the Cotton Construction Co. was low. Binghamton, N. Y., recently noted as contemplating the purchase of pipe, has come into the market for about 400 tons.

Oil Country Demand Brisk

Buffalo, Aug. 28.—Oil country pipe demand is especially brisk and South American interests are inquiring in the local field for 2500 tons of special sizes. Prices remain firm.

Small Sales Increase

Chicago, Aug. 28.—Total tonnage of cast-iron pipe placed during the past week shows an increase over that of the previous week one of the principal producers reports deliveries more than a week further behind than at the first of August. Prices in small sizes are unchanged and lack firmness. In the larger sizes there has been a decided stiffening with some quotations at premiums which are easily obtained. The outstanding award in prospect is the 2700 tons for the Chicago sanitary district. General contract for this work has been let and the pipe is expected to be placed shortly. The city of Hibbing, Minn., placed 600 tons during the week.

Lettings Slowing Up

Birmingham, Ala., Aug. 27.—Pressure pipe lettings being received here do not aggregate as much as previously. The American Cast Iron Pipe Co. had orders in the past week from Chicago, for 570 tons and from Glendale, Cal., for 169 tons.

Municipal Buying Still Heavy

Cleveland, Aug. 28.—Buying of cast iron pipe in this district continues to center around municipal purchases, A heavy tonnage of pipe is being used by the waterworks department of this city, the largest recent jobs being those for Superior road, Lorain avenue and Magnolia drive projects. The first mentioned will require 973 tons of 24-inch straight pipe and 9 tons of fittings. The general contract for this was let to J. T. Martin. The Lorain avenue work will take 1890 tons of 24-inch straight pipe and 61 tons of fittings. Joseph Kalill, of Jackson, O., is general contractor. On the Magnolia drive job of which 1950 tons of 36-inch straight pipe and 100 tons of fittings will be needed, the Cherry Connelly Construction Co. is general contractor. In September the filter building work of the Baldwin reservoir and a heavy tonnage of valves in which there will be 266 pieces

will be up for figures. There will be 40 30-inch and 20 24-inch hydraulically operated valves, 1 24-inch check valve and 105 other gate valves ranging in size from 4 to 54 inches.

CAST IRON PIPE AWARDS

600 tons, 6 and 8-inch pipe for city of Hibbing Minn., to United States Cast Iron Pipe Co.
380 tons, 16-inch Class 'C' pipe for Los Angeles, to American Cast Iron Pipe Co.
200 tons, miscellaneous small sizes for Flint, Mich., to the National Cast Iron Pipe Co.
150 tons, work for Evansville, Ind., to the National Cast Iron Pipe Co.
110 tons, 10-inch Class 'B' pipe for Santa Cruz, Cal., to United States Cast Iron Pipe & Foundry Co.

CAST IRON PIPE PENDING

5000 tons, department of water, gas and electricity, New York; Beaver Engineering Co. low on general contract.
3750 tons, 6, 8 and 12-inch pipe with fittings for department of water, gas and electricity, New York, bids close Sept. 7.
2700 tons, Chicago sanitary district; bids in.
2200 tons, 4, 6 and 8-inch Class 'C' pipe for Montecito, Cal.; pending.
2050 tons, 1950 tons 36-inch straight pipe, 100 tons fittings, Magnolia drive project, Cleveland; Cherry Connelly Construction Co., general contractor.
1890 tons, 24-inch straight pipe Lorain avenue ject, West 117th street to Rocky river, Cleveland; Joseph Kalill, of Jackson, O., general contractor.
973 tons, 24-inch straight pipe for Superior project, Cleveland; J. T. Martin awarded general contract.
700 tons, department of water, gas and electricity, New York; Cotter Construction Co., low on general contract. Work may come up for new figures.
600 tons, 4 and 6-inch pipe for Oak Lodge water district, Oak Lodge, Ore.; pending.
527 tons, 6, 8 and 12-inch Class 'B' pipe for Santa Barbara, Cal.; United States Cast Iron Pipe & Foundry Co. low bidders.
400 tons, Binghamton, N. Y.; bids asked.
188 tons, 4 and 6-inch pipe for Sacramento, Cal.; bids opened.

Tin Plate Users

Are Asking for Quotations on 1924 Business—Books Not Open

TIN PLATE PRICES, PAGE 571

Pittsburgh, Aug. 28.—Most of the tin plate output for the fourth quarter already is obligated to regular customers although books have not been opened for that period. The Texas Co. inquiry for 75,000 base boxes still is current, as is one from another oil interest to replace a large tonnage contracted for some time ago at $4.75 which it allowed to go by default, having delayed its specifications. It now encounters a $5.50 market. Stock lists are slim, all producers with one exception having disposed of the major portion of stock plate. Among all producers it is estimated that tin plate in stock does not aggregate more than 5000 tons at the present time and the one interest referred to isunderstood to have about one-half of that tonnage.

Ask 1924 Tinplate Contracts

New York, Aug. 28.—Consumers of tin plate seem to be seeking to anticipate the heavy buying expected in September and an increase of inquiry is noted. Some of these inquiries extend to January and February, but no quotations for 1924 delivery will be made at this time. This indicates the eagerness of users to cover. The price is generally $5.50, per base box, Pittsburgh, though some producers are asking more, as they do not desire to take business in their present well sold condition.

Sheet Interest Improves

Mills More Successful in Booking Black Tonnages—Prices Show More Stability—Fourth Quarter Quotations Undetermined

SHEET PRICES, PAGE 571

Pittsburgh, Aug. 28.—Improvement in the sheet market is made manifest in several ways. Increased specifications, more new inquiries, additional efforts to place tonnage for the fourth quarter, and a slight increase in operating schedules are noted.

Warehouse operators from whom nothing has been heard for two or three months have become active in furnishing specifications, seeking early replenishment of their stocks of different grades of sheets. Auto parts makers who a short time ago were anticipating slack business for the last four months of the year, are again placing orders. One which had decided that 10,000 to 15,000 tons under order would be sufficient for its needs, decided this past week to increase its bookings by 50,000 to 60,000 tons additional.

Stocks at the present time among users and jobbers alike in many cases are subnormal; they had been allowed to dwindle until they have reached the danger mark, for while several independent interests still lack tonnage, particularly of black sheets, the American Sheet & Tin Plate Co. cannot discharge its present obligations before the end of October and its books have not yet been opened for the last quarter. The premature report issued by a New York newspaper office last week reaffirming the present prices for the last quarter proved incorrect. This will not be done until after Labor Day since following the closing of business Aug. 31 it will make tabulations of its obligations and expend every effort possible to determine what effect the shorter workday will have upon production costs before deciding what the next quarter's prices will be. Average operation of sheet mills in this vicinity hover around 85 to 88 per cent. Prices are for the most part firm, there being practically no departures from the 3.00c, 3.85c, 5.00c and 5.35c, base Pittsburgh levels on blue annealed, black, galvanized and full-finished automobile sheets, respectively. The exception still appears to be black sheets, two or three mills which need tonnage being willing to sell at 3.75c, base Pittsburgh.

Prices Remain Strong

New York, Aug. 28.—Steel sheets have changed little, though galvanized are strong at 5.50c, Pittsburgh. Rumors are heard of shading on black sheets but sales are being made at 3.85c. Blue annealed sheets are without feature at 3.00c, Pittsburgh. An announcement already has been made as to the prices for fourth quarter by the leading producer. Jobbers are specifying fully on their contracts, taking this opportunity to fill their assortments in preparation for the heavy demand they expect in the fall. This is assisting mills in keeping their rolling schedules full.

Interest in Market Increases

Youngstown, Aug. 28.—Buying interest in sheets, which has shown some weakness during the past few weeks, is slightly improved although the betterment cannot be classed as strong. At the forefront of the improvement is the fact that various mills have been successful in booking black tonnage in a slightly better volume. Practically all tonnage that has come out is for immediate shipment and is priced at 3.85c, base Pittsburgh. While rumors have permeated the trade that black sheets have sold recently at a concession of $2 a ton, the purchases in this connection have failed to undermine the policy of district sheetmakers generally to quote under the market.

Export demand the past few weeks has bolstered up production programs of certain mills here and in some cases premiums of $1 a ton on the business is reported. The roofing business has lapsed into decided dullness although no reception is accorded new inquiry for galvanized under 5.00c, base Pittsburgh. Blue annealed continues in good demand and is the strongest from the standpoint of tonnage of the three grades. Quotations are firm on this grade at 3.00c, Pittsburgh. Buying demand is growing stronger for fourth quarter high-grade sheets and several consumers of the automobile grade have placed orders within the past week at a price to be determined later. No. 22 automobile sheets are quoted unchanged at 5.35c, Pittsburgh, with the leading district producer out of the market for the remainder of this quarter.

Motor Car Builders Inquiring

Detroit, Aug. 28.—Automobile manufacturers are inquiring for sheets and mill representatives believe a fairly large tonnage will be let this week. The Ford Motor Co. is reported in the market for a large tonnage of sheets for early delivery. A number of the automobile firms are ready to place good tonnages before Labor day. Prices on blue annealed and galvanized are holding firm. Black sheets are moving slowly, with prices at 3.85c, base Pittsburgh, although some small sales around 3.75c are said to have been made. Blue annealed sheets are quoted at 3.00c and galvanized at 5.50c. Demand has been fair.

Fourth Quarter Sales Heavy

Chicago, Aug. 28.—One of the leading sheet makers in this district has just opened its books for fourth quarter and indications are that within a few days total capacity for balance of the year will be booked. Price for fourth quarter continues unchanged.

Greater Interest Noted

Buffalo, Aug. 28.—Greater interest in fourth quarter demand for sheets has appeared and there is a general feeling that no lower prices will be forthcoming this year.

Await Fourth Quarter

Philadelphia, Aug. 28.—The sheet market generally is quiet, awaiting fourth quarter price announcement. The price is expected to be the same as for the third quarter. Consumers are taking full tonnages and current prices are unchanged.

Structural Awards Larger

Letting of 21,000-ton lot by Jersey Central Railroad to American Bridge Co. Features Market—Much Activity Deferred

STRUCTURAL SHAPE PRICES, PAGE 571

New York, Aug. 28.—Outstanding among structural awards is 21,000 tons for the first section of the Jersey Central railroad bridge over Newark bay, the contract going to the American Bridge Co. The remainder of the bridge work, involving 25,000 to 30,000 tons, will come up for figures in about two months, according to present indications. The first section of the Thompson-Starrett apartment project in the Grand Central zone, involving about 5000 tons, is also understood to have been placed. The entire project will require close to 10,000 tons, as stated previously.

The closing of these tonnages has made for probably the best week in the metropolitan district this year, the larger awards involving at least 35,000 tons. Several fair-sized lofts and apartments were included in recent awards. New inquiry was lighter than a week ago, but has involved several fairly good tonnages. As a matter of fact, considerable tonnage is actively pending. Bids went in yesterday on several projects including 2000 tons for the hospital hotel at Seventy-second street and West End avenue.

Shapes continue strong at 2.50c, Pittsburgh, with some trade interests looking for an advance within the next month. While the independent mills are booked ahead about two months, it is possible in some instances for a fabricator to do much better on deliveries. With current prices higher than those at which contract work was taken sometime ago, some of the mills, where possible, are accepting current business for early rolling. In fact, the question of mill deliveries is not nearly the important factor that it was. The majority of fabricating shops are quoting around three months.

Awards Continue Negligible

Cleveland, Aug. 28.—Demand for structural shapes in this city still is limited although in the surrounding district there is some activity, composed mostly of small tonnages. Two jobs calling for lots exceeding 100 tons each were outstanding in the lettings of the week. Considerable work is being contemplated although little is actively being brought up for figures. An increased buying movement is expected in the fall when these projects materialize. Plain shapes continue to be quoted at 2.50c, base Pittsburgh, with an 8 or 10-week delivery now possible.

Even Level Maintained

Chicago, Aug. 28.—Leading fabricators are booked far ahead for structural work and are not greatly concerned over current new business. However, the awards of the past week show a total mostly small tonnages. The state of Washington let approximately 1000 tons or six weeks. The awards have been equal to the average of the past five for a legislative building at Olympia and a Milwaukee manufacturer placed 1700 tons for a coal unloading bridge. Three additional buildings each calling for the same tonnage are to be built. The Great Northern has placed 900 tons for bridge work. New work of the Chicago Sanitary district calls for 750 tons.

Market Remains Quiet

Boston, Aug. 28.—The structural steel market has been quiet this week and prices of the leading interests on shapes and plates are holding firm at 2.50c, base Pittsburgh. Some of the independents have been taking business at 2.40c, but this represents only small orders and does not truly reflect the price situation. There were no important contracts awarded during the week and no important inquiries were brought out. One large company reports that its plants are booked ahead at capacity until the winter months, so that the present lull is causing no uneasiness. Another leading interest has experienced a slightly livelier demand in August than in June and July. The trade is looking forward confidently to a good run of orders in the fall. The Masonic building project will come along around the beginning of autumn. The largest project up at this time is the new Statler hotel which is to be erected in Boston and which will require in the neighborhood of 4000 tons. It is uncertain when building will begin on this.

Activity Still Deferred

Pittsburgh, Aug. 28.—Building activity in the Pittsburgh area still is deferred. Several projects up for consideration involve the sale of stock or the accumulation of funds by popular subscription before advertisements for bids can be published. Local bridges involving 4000 or 5000 tons likewise are deferred. Fabricators in this territory continue to enjoy more or less success in bidding upon work at far distances. McClintic-Marshall Co. has received the award of the assembly building at River Rouge, Mich., for the Ford Motor Co., about 4000 tons, and the American Bridge Co. was the successful bidder upon a bridge over the Saginaw river for the Pere Marquette railroad involving 500 tons. No change in the market price of structural shapes is apparent, 2.50c, base Pittsburgh, continuing the representative figure.

Demand Is Better

Philadelphia, Aug. 28.—Demand for structural shapes is better here, with the 2.50c, Pittsburgh base, price holding strong, excepting one maker who continues to quote 2.40c. Sales are at a higher level with one maker having from 4000 to 5000 tons inquiry, all of which is alive and is expected to be closed soon. This total includes from one to three jobs of 500 tons each, with some 300 to 1000-ton lots and several smaller. This maker's bookings are exceeding his shipments. Deliveries may now be had in from three to five weeks.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 48,154 tons
Building awards last week ..... 15,163 tons
Building awards two weeks ago... 18,818 tons

21,000 tons, section of the proposed Newark Bay bridge of the Central Railroad of New Jersey, to American Bridge Co.; remainder of structure, involving 25,000 to 30,000 tons, expected up for figures in about two months.

5000 tons, Thompson-Starrett apartment, Forty-seventh street and Park avenue, New York, to the American Bridge Co.; about 5000 tons for this project to come up later.

4000 tons, assembly plant at River Rouge, Mich., for the Ford Motor Co., Detroit, to McClintic-Marshall Co.

1700 tons, coal unloading plant at Milwaukee, to Independent fabricator.

1600 tons, school No. 79, New York City, to the Lehigh Structural Steel Co., John P. Grady, general contractor.

1500 tons, Dwight P. Robinson apartment, New York, to the Heddon Iron Construction Co.

1500 tons, building for Pennsylvania Sugar Co., Philadelphia, to McClintic-Marshall Co.

1400 tons, Dumbarton bridge for Hetch Hetchy project, to United States Steel Products Co.

1200 tons, Roth loft building, Thirty-fifth street, New York, to Hay Foundry & Iron Works.

979 tons, legislative building, State of Washington, Olympia, Wash., to Poole & McGonigle.

900 tons, bridge for Great Northern railroad, to Milwaukee Bridge Co.

850 tons, Roth loft building, New York, to the Heddon Iron Construction Co.

800 tons, fourth section of Standard Oil Co. office building, 18 Broadway, New York, to Levering & Garrigues.

750 tons, Chicago sanitary district work; general contract let to Griffiths Co., Chicago.

600 tons, Siegel apartment, 17 East Sixty-ninth street, New York, to the Paterson Bridge Co.

500 tons, Klaus apartment, 241 West Seventy-fourth street, New York, to the Hinkle Iron Works.

500 tons, bridge over the Saginaw river, Michigan for the Pere Marquette railroad, to the American Bridge Co.

500 tons, building for McCall Publishing Co., Dayton, O., to the Dayton Structural Steel Co. and the Berger Iron Works.

500 tons, additional steel for Ford Motor Co., sawmills, Iron Mountain, Mich., to Worden-Allen Co.

400 tons, garage at West Sixty-fifth street, New York, to Hinkle Iron Co.

350 tons, municipal bank building, Brooklyn, N. Y., to Hinkle Iron Co.

300 tons, Odd Fellow's hall, Brooklyn, N. Y., to Communipau Steel Co.

300 tons, plaster mill, Grand Rapids, Mich., to independent fabricator.

220 tons, mill building for Cleveland Stone Co., Amherst, O., to Forest City Steel & Iron Co.

210 tons, building at Ninth and Vincent streets, Cleveland, to Massillon Bridge & Structural Co.

200 tons, building for the Pittsburgh Malleable Iron Co., Pittsburgh, to John Eichleay Jr. Co.

170 tons, building for Nickel Plate railroad, to Fort Pitt Bridge Works.

160 tons, 6300 Euclid building, Cleveland, to Van Dorn Iron Works Co.

151 tons, girder spans and miscellaneous repairs for bridge No. 2, central division, Missouri Pacific railroad, Gleason, Ark., to American Bridge Co.

150 tons, residence, Mill Neck, Long Island, to Lehigh Structural Steel Co.

138 tons, four 70-foot deck plate girder spans for Chicago, Great Western railway, to American Bridge Co.

131 tons, power station, Portland Railway, Light & Power Co., Portland, Ore., to Puget Sound Iron & Steel Co.

125 tons, college of science and law, Marquette university, Milwaukee, to Lakeside Bridge & Steel Co.

120 tons, work for Power Specialty Co., New York, to Lakeside Bridge & Steel Co.

STRUCTURAL CONTRACTS PENDING

2000 tons, hospital hotel, West End avenue and Seventy-second street, New York; bids in.

1900 tons, barges, United States government at Louisville, Ky.; bids being taken.

1200 tons, apartment at Broadway and Eighty-eighth street, New York; pending.

900 tons, retort house, Buffalo, N. Y.; bids asked.

900 tons, loft building, Forty-seventh street and Sixth avenue, New York; bids asked.

500 tons, apartment, Tenth street and Fifth avenue, New York; bids in.
400 tons, United States Gypsum Co. plant, Sweetwater, Tex.; bids being taken.
300 tons, building for the Norma Co. of America, Stamford, Conn.; Porcupine Co., reported low bidder.
250 tons, parochial school, Brooklyn, N. Y.; bids asked.
250 tons, stadium for Washington Lee university, Lexington, Va.; bids being asked.
250 tons, Elks lodge at Santa Rosa, Cal.; bids being received.
195 tons, subway at Sacramento, Cal.; bids in.
150 tons, bridge for Sonoma county, Cal.; bids in.
100 tons, 6-story building, University and Shattuck streets, Berkeley, Cal.; pending.
Several hundred tons, loft in West Thirty-seventh street, New York; bids asked.

Car Loadings Again Pass Million Mark

Washington, Aug. 28.—Railroads loaded 1,035,741 freight cars in the week ended Aug. 18, coming within 530 cars of the record set in the week ended July 28. The total for the week just ended is the second largest on record. The railroads loaded 30,999,244 cars in the 33 weeks of this year, exceeding by 5,200,000 the total loading for this period last year.

To Offer Battle Ships in October Sales

The first opening of bids for the sale of warships condemned by limitation-of-armaments treaty will take place at the Washington navy yard on Oct. 24, when the uncompleted battle cruisers and battleships in navy yards will be offered for sale as scrap. This includes the battle cruisers UNITED STATES and CONSTITUTION at the Philadelphia yard, the battleships SOUTH DAKOTA and INDIANA at the New York yards, the battleship MONTANA at the Mare Island, Calif. yard, and the battleship NORTH CAROLINA at the Norfolk, Va., yard.

One week later, on Oct. 31, the navy department will take bids for the sale of condemned warships that are afloat. This will include the battleships NEBRASKA, GEORGIA, RHODE ISLAND, CONNECTICUT, LOUSIANA, VERMONT, KANSAS, MINNESOTA, NEW HAMPSHIRE and MICHIGAN, and possibly one or two more.

On Nov. 7 the battleships and cruisers of the new program, still on the ways at private yards, will be offered. This includes the battleship IOWA and the battle cruisers CONSTELLATION and RANGER at the Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; nad the battleship MASSACHUSETTS at the Fore River, Mass., yard of the Bethlehem Shipbuilding Corp.

The uncompleted ships each would have exceeded 43 000 tons in displacement. The older ships to be sold on Oct. 31, average about 17.000 tons. Since practically all of the uncompleted ships are still on the ways they must be broken up at the yard.

Sales of mechanical stokers in July fell off, only 129 being listed, according to the department of commerce. This is a drop of six from the 135 sold in June and 65 less than the 194 sold in May. Sales of fire tube boilers increased from six in June to 21 in July while water tube boilers dropped from 129 in June to 108 in July.

Rail Buying Alone Active

Cars Orders at Standstill and Interest of Railroads Centers on 1924 Rail Requirements—Some Tie Plates in Demand

RAILROAD TRACK MATERIAL PRICES, PAGE 571

New York, Aug. 28.—Demand for cars is virtually at a standstill, no awards or inquiries of consequence being noted. Although two of the leading eastern railroads are reported to have closed recently on large contracts, orders for locomotives at this time are confined to a few small scattered lots. The Baldwin Locomotive Works has booked orders for the Savannah & Atlanta, one for the Kanawha, & Hocking Coal & Coke Co., and two for the Richmond, Fredericksburg & Patomac, the latter also closing on two to the American Locomotive Co. The Lima Locomotive Works has been awarded a switch engine by the Lakeside & Marblehead railroad.

Buying Still Heavy

Chicago, Aug. 28.—Western roads continue to contract for large tonnages of rails for 1924 delivery and for much miscellaneous material for car repair work. Actual orders for new cars have dropped off rather abruptly. A frog and switch company took 12,000 tons of rails for 1923 delivery. A Western railroad took 5000 tons of rails for 1924 delivery and one authority estimates that the total tonnage placed during the week for 1924 delivery was in excess of 50,000 tons. The Baltimore & Ohio is in the market for 10,000 tons and the Canadian National railway is inquiring for 35,000 tons. The Union Pacific is inquiring for 200 tank cars. Railroad orders for miscellaneous material for car repair work total at least 4000 tons.

Repair Buying Heavy

Philadelphia, Aug. 28.—Railroad buying of plates and shapes for repair work continues to be in large volume. The Pennsylvania railroad is in the market for 40,000 tie plates.

Low Operations Curtail Orders

Pittsburgh, Aug. 28.—Continued slack operations among coal mines in central Pennsylvania and southern West Virginia still limit the bookings of light rails by producers of the billet-rolled product. Small orders from time to time are noted at 2.25c, base Pittsburgh, but these rarely involve more than a single carload at a time. Numerous orders still are being placed with the rerollers at $5 to $7 per ton less than the current market. The aggregate tonnage of light rail business pending is not sufficiently large to furnish an incentive to cut under the 2.25c figure.

CAR ORDERS PLACED

Erie railroad, 498 coke car conversions to box cars, to Pressed Steel Car Co.
Montour railroad, 500 hoppers, reported awarded to Standard Steel Car Co.
Norfolk & Western railroad, 1000 hopper repairs, 500 each to Virginia Bridge & Iron Co. and Ralston Steel Car Co.

CAR ORDERS PENDING

Union Pacific railroad, 200 tank cars; pending.

Mining on Heavy Scale

Duluth, Aug. 28.—Mining operations on the Minnesota ranges is being maintained on a heavy scale. Oliver Iron Mining Co. and independents are rushing ore to the docks. Mine officials are now sanguine that the seasons ore shipments from the Lake Superior district will aggregate 60,000,000 tons. No labor shortage exists on the ranges. The efficiency is reported as improving. The open-hearth blast furnaces and wire mills of the Minnesota Steel Co. are being maintained nearly at capacity. The demand for wire products is improving.

Iron and Steel Output in Britain Declines

European Staff Correspondence

London, Aug. 17.—Production of pig iron in Great Britain in July according to the official figures of the National Federation of Iron and Steel manufacturers was 655,100 gross tons compared with 692,000 tons in June, 714,000 tons in May, 652,200 tons in April, 567,900 tons in January, and 399,100 tons in July, 1922. This is 37,800 tons less than the output for last month and 59,100 tons less than the output for May, which was the highest since September, 1920, when production reached 741,000 tons. There were 206 furnaces in blast at the end of July compared with 222 at the end of June, 223 at the end of May, 216 at the end of April, 183 on Jan. 31, 169 at the end of 1922, and 77 at the end of 1921. The pig iron production in July included 218,900 tons of hematite, 200,600 tons of basic, 147,200 tons of foundry and 44,700 tons of forge grades.

The production of steel ingots and castings in July was 624,300 tons compared with 767,700 tons in June, 821,000 tons in May, 749,400 tons in April, 634,100 tons in January and 473,100 tons in July, 1922. This is 143,400 tons less than the output for last month and 196,700 tons less than the output for May, which was the highest output since September, 1920.

Details of the pig iron and steel output from January, 1921 to July, 1923 are shown in the following table:

PIG IRON

	1923	1922	1921
Jan.	567,900	288,000	642,100
Feb.	543,400	300,100	463,600
March	633,600	389,800	386,000
April	652,200	394,300	60,300
May	714,200	407,900	13,600
June	692,900	369,200	800
July	655,100	399,100	10,200
Aug.		411,700	94,200
Sept.		430,300	168,300
Oct.		481,500	235,600
Nov.		493,900	271,800
Dec.		533,700	275,000
		4,899,500	2,611,400

STEEL INGOTS AND CASTINGS

Jan.	624,300	327,500	493,400
Feb.	707,100	418,800	483,500
March	802,500	549,400	359,100
April	749,400	404,200	70,600
May	821,000	462,300	5,700
June	767,700	400,200	2,700
July	624,300	473,100	117,200
Aug.		528,400	434,100
Sept.		555,900	429,300
Oct.		665,200	405,400
Nov.		600,800	443,800
Dec.		546,100	381,000
		5,831,900	3,625,800

The Nonferrous Metals

Metals Are More Active Although Buyers Show Caution in All Lines—Zinc and Lead Strong—Copper Quiet

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Aug. 22.....	14.00	14.25	40.00	6.70	6.50	26.00	7.62½	29.00
Aug. 23.....	14.00	14.25	40.12½	6.70	6.50	26.00	7.55	29.00
Aug. 14.....	14.00	14.52	39.87½	6.75	6.50	26.00	7.55	29.00
Aug. 27.....	14.00	14.25	40.37½	6.75	6.45	26.00	7.50	29.00
Aug. 28.....	14.00	14.25	40.87½	6.87½	6.42½	25.75	7.50	29.00

†Outside market quotation.

NEW YORK, Aug. 28.—The metal markets have been a little more active the past week, though buyers have continued to manifest caution in all lines. A good export business was done in copper to practically all the important European consuming countries last week, but subsequently foreign demand subsided.

Domestic consumers took up a fair tonnage of electrolytic at 14c, delivered, but not enough to affect the price position materially. Some agencies advanced their quotation to 14.12½c, delivered, but copper has remained available in almost any quantity at 14c. Casting copper reacted to 13.75c, refinery. Lake has been obtainable at 14.25c, delivered. The price of rolled and drawn copper and brass products were reduced ¼c to ½c on Aug. 23. Unfilled orders of the mills have been declining steadily and deliveries accordingly improving. The decrease in prices of mill products has been a reflection of the competition for orders.

The American Smelting & Refining Co. advanced its lead contract price $5 a ton Aug. 27 to 6.75c, New York. This brought the contract price to the same level which had obtained for a week previously in the outside market. Sales of lead in the Middle West were especially large last week and prices advanced by Aug. 28 to 6.87½c, East St. Louis. Production has been curtailed and foreign prices continue more attractive than New York prices to sellers of foreign lead.

Zinc export sales last week were upward of 8000 tons, the first important export movement in zinc in six months taking place. This business stiffened up American prices to 6.50c, East St. Louis, especially as labor troubles retarded production of some of the smelters. The labor situation has improved. The ore producers have had a firm grasp on their market and the price of ore has been strong, contributing to the stability of the zinc situation. On Aug. 28, however, export demand had disappeared and the market reacted to 6.42½c, East St. Louis.

The United States Steel Corp. has been a buyer of tin and other tin plate makers recently have taken good tonnages in London and in this market. The price has recoverd to above 40c for Straits tin. On Aug. 28 sales of spot Straits were made at 40.87½c. It is expected that Aug. 31 statistics will show a decline in the world visible supplies, due to small Straits and Banca shipments.

The antimony market has eased off to 7.50c, duty paid, with the wave of bullish enthusiasm that swept the market a few weeks ago almost vanished. Resale lots from holders who want to take profits have caused the reaction.

Aluminum demand has been somewhat improved and supplies of virgin 98 to 99 per cent ingot are as scarce as ever. Only occasionally are lots offered at less than 26c, f.o.b. New York, the nominal quotation. Importers are practically all out of the market.

The base price of sheet zinc has been advanced 35 points from 8.90c to 9.25c, f.o.b. mill.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min.	22.50
High brass	18.50
Zinc, ga. 9 to 18 (plates ½c less)	9.25
Lead, full sheets (cut ¼c more)	10.25
Aluminum, base 18 ga. and up...	**35.40**
SEAMLESS TUBES	
High brass	24.00
Copper	25.50
RODS	
High brass, round, ⅜ to 2½-inch	16.75
Naval brass rod	19.50
WIRE	
Copper	16.50 to 17.00
High brass	19.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	9.00 to 9.25
Chicago	9.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	7.50
Cleveland	6.00 to 6.50
ZINC	
New York	4.25
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
Cleveland	11.00 to 11.50
New York	11.25 to 11.75
Chicago	11.50
RED BRASS TURNINGS	
New York	8.00 to 8.25
Cleveland	8.50 to 9.00
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	7.50
ALUMINUM BORINGS	
Cleveland	8.00 to 9.00

New Ingot Mold Foundry Now Operating

The Vulcan Mold & Iron Co. has built a new ingot mold foundry at Latrobe, Pa. Operation was started three months ago and now it is producing about 50 tons daily. The Vulcan company is specializing in high grade split molds for crucible and electric furnaces running in all sizes and shapes and through the purchase of the entire mold business of the Blairsville Iron Works has on hand patterns and equipment for the manufacture of most sizes used by the various tool steel companies in the country.

The plant, which occupies five acres of land, consists of the main foundry, 180 x 300 feet, in which all molding is done by molding machines, and one building, 70 x 90 feet. Auxiliary buildings include machine and pattern shops. The authorized capital stock of the company is $500,000 which is nearly all owned in Latrobe, Pa. The board of directors is as follows: D. T. Sipe, chairman of board; C. M. Semler; M. W. Saxman; J. E. Barnett; F. B. McFeely; H. H. Smith; E. H. Williams, president.

Recovery of Fluorspar Doubled in 1922

Washington, Aug. 28.—Merchantable fluorspar recovered in the United States in 1922 totaled 133,259 net tons, compared with 59,913 tons in 1921, according to the federal geological survey. The average f.o.b. mine price in 1922 was $17.88, a decrease of $2.83 per ton from 1921. Of the 49 producers active in 1922, Kentucky accounted for 25 and Illinois for 12. Imports of fluorspar in 1922 aggregated 33,108 tons valued at $299,188, or $9.04 per ton. Fluorspar available for consumption in 1922 amounted to 172,408 tons. The steel industry in 1922 used 122,403 tons valued at $1,987,586, making the average per ton $16.24, against $19.02 in 1921 and $36.29 in 1920.

Short Day Change

Half Completed in Pittsburgh District —Independents Active

Pittsburgh, Aug. 28.—The first among independent iron and steel companies fully to adopt the shorter workday is the Pittsburgh Steel Co. which completed the change-over last night. Six hundered men employed at 12 open hearths and two blast furnaces at the company's Monessen, Pa. plant are affected by the change. No 12-hour men are employed at the Glassport and Brownsville, Pa. plants of the company. Details are not announced but probably a plan similar to that of the Carnegie Steel Co. is being followed by which for 10 days past shifts have been started at 7 a. m., 3 and 7 p. m.

This action of the Pittsburgh Steel Co. brings the total number of 12-hour men eliminated or changed to a shorter shift in excess of 25,000 in the Pittsburgh district, so that the change-over is approximately 50 per cent complete. Of the 25,000 men, 20,000 are employed at plants of the Carnegie Steel Co. Other independents, including the Jones & Laughlin Steel Corp., are working on similar change-overs and a number are awaiting the ironing out of difficulties and misunderstandings before adopting the best plan discovered for smooth operation.

Production Is Unchanged In Chicago District

Chicago, Aug. 28.—The Illinois Steel Co. blew out another stack at Joliet during the past week. This makes two stacks down at Joliet and three down for all works, leaving 24 stacks in operation. Production of finished and semi-finished steel at the company's various works continues unaltered and is reported slightly in excess of 90 per cent of capacity. The closing down of this third stack is not expected to effect production for a long time as the company's pig iron storage is heavy, probably 90,000 tons.

Production at plants of the independent steel companies continues unchanged. Car supply is somewhat scarcer because large numbers have been diverted to the bituminous field to be ready for any emergency which may develop. Operations under the shorter hour program are now working more smoothly. Labor supply is reported adequate for present needs.

Independent Operations Remain Steady

Youngstown, O., Aug. 28.—Independent steel works operation in the Mahoning valley this week is substantially the same as one week ago. Semifinished and finished commodities on order still command 86 per cent operation of open hearths in addition to full schedules at the two independent bessemer departments. The Youngstown Sheet & Tube Co. has 20 open hearths engaged at its two divisions, the Republic Iron & Steel Co. 12, and the Trumbull Steel Co. and the Sharon Steel Hoop Co. six each or a total of 44 units.

District sheet mill capacity continues to be operated on a reduced basis with 66 per cent of the mills active. The aggregate includes 22 at the Youngstown company, 17 at the Newton Steel Co., 15 at the Trumbull company, eight at the Republic, seven at the Sharon company, six at the Falcon Steel Co. and four at the Mahoning Valley Steel Co.

Miscellaneous activity is unchanged. The Republic company is operating seven finishing mills, its bessemer department and six pipe mills; the Youngstown company one merchant, 10 pipe and four plate mills and its rod, wire and bessemer department; and the Falcon company seven hot tin mills at its Canton, O., plant.

Employment in Michigan Picking Up

Detroit, Aug. 28.—Employment conditions in the industrial centers outside Detroit are brightening up, employers' reports show. Demand for common labor as well as for machine hands shows an increase for Flint, Grand Rapids, Lansing, Bay Sity and some of the smaller towns.

The greatest activity for machine hands is shown in the two automobile centers, Lansing and Flint. Plants in those cities reduced working forces about 10 per cent through the extreme hot weather. At the Buick plant in Flint it is reported 26,000 men now are employed and this total will be augmented with semiskilled men as fast as they can be obtained. At the Chevrolet plant, which has been operating with about 12,000 men, the force will be increased as soon as men can be obtained.

At Lansing operations of the Reo Motors Co., and of the Motor Wheel Corp, no reduction in working forces has been made. On the other hand the huge expansion programs of both companies will call for a liberal number of workers in the fourth quarter of the year.

For the first time in eight weeks industrial plants of this city have shown an increase of workers. Nearly all the big companies continue to run behind in production, especially at the Ford Motor Co., Buick, Hudson, Dodge Brothers and Chevrolet plants. The Durant Corp. announces it will start its large plant at Flint about Sept. 15.

Roads Seek to Cut Rates to Pacific Coast

Washington, Aug. 28.—Transcontinental railroads have asked the interstate commerce commission for permission to reduce freight rates from Chicago and groups west to the Pacific coast, without reducing rates from intermediate points, in order to meet Panama canal competition. The petition of the railroads lists 47 articles, of which 16 are iron and steel. The reduction in iron and steel articles, 80,000-pound minimum would be from $1.07½ to 75 cents per 100 pounds, and on wire goods and wire cable from $1.27½ to 90 cents. The first figure in each instance represents the group farthest east. The railroads have requested an early decision by the commission because of the business being diverted or liable to be diverted to the canal. There appears to be some doubt here whether the commission's reply will be favorable.

Immigration Preferred

Washington, Aug. 28.—Secretary of Labor Davis said today that among the numerous immigration bills to be offered in congress next session will be one providing for unlimited immigration from preferred countries like German, Norway, Sweden, England and other northern European countries. A bill calling for this is to be drafted by a member of congress on his own initiative, it was stated. Under this program latitude and longitude boundaries would be drawn, substantially all of some races and peoples barred and no limitation placed upon the movement of others. Secretary Davis' bills will deal only with registration and selection of aliens. The present 3 per cent act expires on June 30, 1924, necessitating some sort of act at the session of congress convening in December.

Gulf State Net Gains

Net earnings of the Gulf States Steel Co., Birmingham, Ala., for the first half of the current year were $973,906, equivalent after preferred dividends to $8.05 a share on the 112,120 shares of common stock. Net in the first quarter was $533,978 and it was $439,928 in the second quarter. Earnings are probably between $300,000 and $400,000 for the current quarter. Directors will meet today to take action on quarterly dividends and it is believed that the present 1 per cent rate will be maintained.

European Tour

Of American Foundrymen Starts With Reception and Dinner in London

By Special Cable

London, Aug. 28.—Auspiciously begun by one of the quickest transatlantic voyages since the war, the European tour of the American Foundrymen's association officially commenced in London Saturday morning with a reception at the Hotel Cecil by leading members of the Institute of British Foundrymen and the Iron and Steel institute. The party of approximately 100 Americans, of which 35 are members and ladies of the American Foundrymens' association, left New York on Aug. 18 on the S. S. LEVIATHAN and arrived at Southampton late Friday, Aug. 24.

The reception at the Cecil was followed by a trip to Windsor castle, where by special arrangement, the private royal apartments were inspected.

The Americans were welcomed Saturday morning by V. C. Faulkner, president of the London branch of the Institute of British Foundrymen. Mr. Faulkner stressed the importance of cooperation between the English, French and American foundry industries, declar that "in a three-part mold, representing America, France and England, we are casting the full pattern of international amity."

The brief London visit of the Americans was concluded Monday evening at an unusually brilliant dinner at Hotel Cecil, at which Sir Robert Hadfield in proposing a toast to the American Foundrymen's association mentioned the important work done by President G. H. Clamer, Dr. Richard Moldenke, Walter Wood, Prof. Enrique Touceda and John Howe Hall, to whom he said foundrymen throughout the world are indebted. He also paid a tribute to John A. Penton for his efforts in behalf of the metalworking industries.

Sir Robert referred to the long connections between British and American technology, commencing with Benjamin Franklin who was a member of the Royal society. Admiral Sir George Goodwin following the remarks by Sir Robert Hadfield said that Americans were among the first to introduce science into the foundries. G. H. Clamer, president of the American Foundrymen's association, in reply stated that since the initial visit of A. O. Backert, at the time when he was president of the association, and with the subsequent visits of Messrs. Stubbs, Firth and Cook, officers of the British Institute of Foundrymen, American and British foundrymen had become very well acquainted. He emphasized the necessity of business men guiding postwar policies. Other speakers were V. E. Minnich, president of the American Foundry Equipment Manufacturers association, Oliver Stubbs, past president of the Institute of British Foundrymen and others.

On Monday the American party visited the plant of Stone & Co., founders of bronze propellers and also the Royal Naval college and Greenwich observatory.

To Join European Party

C. E. Hoyt, secretary of the American Foundrymen's association sails from New York on the GEORGE WASHINGTON, Sept. 1 to join the party of American foundrymen, manufacturers and scientists at present making a tour of Great Britain and the Continent. Mr. Hoyt will join this group at London, completing the tour with them, attending the international congress of foundrymen in Paris during September and returning to America with the party about Oct. 1.

Italy Modifies Tariff on Iron and Steel

Washington, Aug. 28.—Aid for the Italian iron and steel industry is seen in the modification of the tariff on some commodities, including iron and steel products, by the Italian chamber of deputies. It is reported to the department of commerce by Commercial Attache H. C. MacLean that the present Italian tariff was approved by the Italian chamber on July 10, with a number of changes. Many of the rates that have been modified cover commodities for which special conventional duties already had been entered into with France, Switzerland and Austria. A special list of new conventional duties on a number of articles has been drawn up, which will apply to nations receiving the most-favored nation treatment, which includes the United States. Reduction of the tariff on pig iron, Attache MacLean says, should facilitate the running of the steel plants, now that cast iron scrap is free from duty.

Owing to the fact that Italy has little coal and small reserves of iron ore, the industry must be given some assistance and protection from foreign competition if it is to thrive, says the report to the department of commerce. Although iron and steel exportation to any large degree will be prevented by this lack of raw materials, many champions of the industry claim that Italy should satisfy the demands of the home market since much of the needs of the country would cost considerably more if sought abroad. Italy now is equipped with nine coke blast furnaces, and 113 electric steel furnaces, of large and medium capacity, and 60 small ones.

Plants Constructed

In Southern States Show Large Increase in Past Six Months

The semiannual report just issued by the G. L. Miller Co., of Atlanta, one of the largest construction financing corporations in the South, shows the first half of the present year to have witnessed a period of notable activity in the construction of new iron and steel plants throughout the southern states, and in extensive additions and improvements that have been carried out by the existing companies in virtually all branches of the metal trades industries.

Among the largest work carried out has been the new merchant mill of the Tennessee Coal, Iron and Railroad Co., Fairfield, Ala., the new steel foundry of the Fairfield car works, several hundred thousand dollars in new construction by pipe plants in Birmingham, and the starting of work on the $1,500,000 plant of the Southern Sheet Steel Co., Chattanooga, Tenn.

The new merchant mill of the Tennessee company as described on page 177, July 19 issue of IRON TRADE REVIEW is one of the largest in the South, covering 80 x 840 feet of space,and with a monthly capacity of 10,000 tons of steel bars. A foundry also has been built having capacity of 1400 tons of steel castings monthly.

Complete plans of the plant of the Southern Sheet Steel Co. include construction of two open-hearth furnaces of 60,000 tons annual capacity, and rolling mills of 55,000 tons annual capacity.

Textile industries of the district also have witnessed the greatest period of activity in the history of the South, increasing total equipment in southern mills since Jan. 1, 1923, by three and one-half per cent. The Miller company's estimate, based on detailed reports from engineering firms that have handled 95 per cent of the new construction work, shows an investment in new equipment of approximately $10,000,000 the first six months, and a total captial outlay of approximately $30-000,000..

This increase has resulted in an unusually large demand the past few months for machinery, mill supplies and equipment, principally such machinery as lathes, drill presses and milling machines. During the first six months of the year southern manufacturers and jobbers of machinery and equipment in this territory experienced probably the largest volume of business they had ever enjoyed, and approximately 30 per cent more volume than the first six months of 1922.

The outlook for the rest of the year appears to be a continuation of this progress and expansion.

Luxemburg Iron Offered in East

Foundry Grade for Pennsylvania Pipemaker Quoted at $21.88, F. O. B.—Receipts of Coke from Ruhr District Increase—British Sheet and Tin Plate Merger Effected—German Workers Striking

Iron Trade Review Staff Cable

European Headquarters,
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2-3 Caxton House, Westminster, S. W.1

LONDON, Aug. 28.—Producers in Luxemburg offer a Pennsylvania pipemaker 5000 to 10,000 tons of No. 3 foundry iron at 465 Belgian francs ($21.88) f.o.b., but the order has not been placed as yet. A leading interest in the Saar has sold to China 2000 tons of beams at £9 ($40.95) f.o.b.

IRON TRADE REVIEW'S correspondent at Dusseldorf reports that the price of bessemer stahleisen, has been marked up to 139,531,000 Siegen, as compared with 100,000,000 marks a week ago, but other quotations are unchanged. It is expected that further advances will be made soon. Many thousands of miners in the Dortmund, Essen and Gelsenkirchen districts are striking against German employers for 25,000,000 marks daily.

Curtailment of production in Great Britain has checked the stocking of pig iron, which amounts to only 30,000 tons. Prices are slightly weaker. A conference of coke makers and furnace men has reaffirmed the price of £1 6s ($5.93), ovens, on coke. The coke interests are preparing to make sacrifices to aid the blast furnaces, and better supplies are promised. In the Midland district the price of angles and sections has been reduced 5s ($1.15) to £9 10s ($43.25). Many makers decline to join in the reduction. The price of semifinished steel has been stabilized at £8 ($36.40). Belgian competition is ineffective. The recent concession in railway rates does not exceed 1s ($0.23) on steel. The market for galvanized sheets is firm and mills are booked to the end of the year.

A new merger of tin plate manufacturers comprises 54 tin plate and 22 sheet mills having a capacity of 500,000 tons. Orders are expanding. Railway business is moderate; constructional work is improving.

The French market is unusually firm for this season. The prospective advance of 10 francs ($0.57) in the price of coke has stimulated buying. The receipts of coke from the Ruhr have been increased to 3900 tons daily. Pig iron prices in France are advancing. An active shortage of semifinished material is leading makers to increase output. Large foreign orders have been placed in certain finished lines. The French blast furnaces operating on July 1 numbered 106, an increase of seven in the month. Thirty-four Belgian furnaces were operating on July 1, representing a reduction of two.

Changes in quotations in the British market noted this week bring the following products to the levels as noted:

West coast hematite £4 18s ($22.30); Staffordshire No. 3 foundry iron £4 15s ($21.61); furnace coke £1 6s ($5.92); plates for home £9 2s 6d ($41.52); Scotch beams for export £8 10s ($38.68); rails for home £8 10s ($38.68); rails for export £8 ($36.40).

Sterling exchange is figured on a basis of $4.55.

More Buyers Enter Market as Prices Steady

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, England, Aug. 17.—Merchants and manufacturers are gradually reappearing in the markets after the holidays. The mill stoppages have been longer than usual and some firms have not resumed.

The drastic curtailment in pig iron output appears to have steadied prices a little, west coast mixed numbers still sticking at the recent figure of £5 15s ($26.22) delivered Sheffield. No. 3 G. M. B. iron is somewhat weaker at £5 2s 6d ($23.37) and east coast hematite is said to be firmer at £4 18s 6d ($22.46), which represents a slight fall in values. No. 3 Derbyshire iron is a weak market at £4 15s ($21.66) for foundry and £4 5s ($19.38) for forge, at the furnace. The stocking of iron is not now a serious matter, and Barrow appears to be disposing of its output, chiefly to the Continent and the Midlands, Scotland and Wales taking a smaller quantity than usual. Exports have fallen off from Middlesbrough and other ports.

Sterling—$4.56

The stoppage of furnaces has had no appreciable effect on the price of coke, recent purchases at Middlesbrough being on a firm basis at £2 1s 6d ($9.46) delivered. Large Welsh firms have paid £1 18s ($8.66) for coke delivered. The fuel saved by the furnace stoppages is understood to have been sold abroad at much higher prices than could be obtained from English blast furnaces. Consumers have held so persistently off the market that the makers speak with some confidence of resumed pig iron buying within the next month, though for this optimism there appears to be no very substantial basis. The most satisfactory item is ferromanganese of which steady shipments have been made, almost wholly, however, on old contracts. New business is decidedly slow.

The decreased value of the franc is reflected in reduced quotations for Belgian steel. After a brief pause on the £8 basis ($36.48), the selling figure for Belgian billets is £7 10s ($34.20), with improved deliveries owing to the resumption of work at the ports. The British makers make no attempt to quote at this price, but they have eased a little down to £7 15s ($35.34) though the majority demand 2s 6d ($0.57) to 5s ($1.14) above these figures. Present

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, August 27

British Market

Corrected to Date by Cable
Home Market Prices. Gross Tons at Works or Furnace

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.99	7 5 0
Sheet bars	32.99	7 5 0
Wire rods	49.48	10 17 6
FINISHED STEEL		
Steel bars, England, ¾ to 3-inch	42.09	9 5 0
Steel bars, England, ¾ to 3-inch, for export	39.81	8 15 0
Plates, ship, bridge and tank, England	41.52	9 2 6
Plates, ship, bridge and tank, England, for export	39.81	8 15 0
Plates, ship, bridge and tank, Scotland	40.95	9 0 0
Plates, ship, bridge and tank, Scotland, for export	39.81	8 15 0
Beams, England	40.95	9 0 0
Beams, England, for export	38.68	8 10 0
Beams, Scotland	40.95	9 0 0
Beams, Scotland, for export	38.68	8 10 0
Sheets, black, 24 gage	56.88	12 10 0
Sheets, black, 24 gage, for export	54.60	12 0 0
Sheets, galvanized, 24 gage	84.18	18 10 0
Rails, 60 pounds and over	38.68	8 10 0
Rails, 60 pounds and over, for export	36.40	8 0 0
Tin plate, base box, 108 pounds	5.23	1 3 0
Steel hoops	52.33	11 10 0
Steel hoops, for export	50.05	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	22.30	4 18 0
Hematite, West Coast, Mixed Numbers	22.30	4 18 0
Basic, Middlesbrough	22.75	5 0 0
No. 3 Foundry, Middlesbrough	22.75	5 0 0
No. 3 Foundry, Derby, Leicester, Nottingham	21.39	4 14 0
No. 3 Foundry, Northamptonshire	21.04	4 12 6
No. 3 Foundry, Staffordshire	21.61	4 15 0
No. 3 Foundry, Scotch	23.32	5 2 6
Ferromanganese, 76 to 80 per cent	81.90	18 0 0
Ferromanganese, 76 to 80 per cent, for export	84.18	18 10 0
COKE		
Yorkshire furnace	5.92	1 6 0
Yorkshire furnace, for export	10.24	2 5 0
Yorkshire foundry	7.96	1 15 0
Yorkshire foundry, for export	11.38	2 10 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

PIG IRON
Prices Last Reported

	†	Marks per metric ton
Hematite, Oberhausen	—*	100,000,000†
Foundry, No. 3, Oberhausen	—	100,000,000†
Bessemer Stahleisen, Siegen	—	139,531,000†
Foundry, No. 1, Oberhausen	—	100,000,000†
Luxemburg Foundry	—	100,000,000†
COKE		
Ruhr furnace	—	34,000,000
Ruhr foundry	—	34,000,000
SEMIFINISHED STEEL		
Billets	—	140,000,000
Sheet bars	—	155,000,000
Wire rods	—	155,000,000
FINISHED STEEL		
Standard rails	—	178,000,000
Merchant bars	—	180,000,000
Structural shapes	—	179,000,000
Ship plates	—	202,000,000
Medium plates, 3 to 5 millimeters	—	227,000,000
Sheets, below 3 millimeters	—	270,000,000
Tin plate		nominal
Plain wire	—	191,000,000
Bands and strips	—	224,000,000

All prices are f.o.b. furnace or mill.
*Dollar equivalents are misleading owing to the terrific depreciation of the mark at present.
†With German coke; where foreign coke is used quotations are higher.
On account of the occupation of the Ruhr these prices are largely nominal and cover domestic business only. Export prices are usually quoted, where deliveries can be made, in foreign currency according to the country of destination.

French Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	25.90	455
Basic bessemer, Lorraine	22.78	400
Foundry, Longwy, No. 3, sand-cast	22.21	390
Foundry, Longwy, No. 3, chill-cast	22.78	400
Ferromanganese, 76 to 80 per cent	88.27	1,550
COKE		
French furnace	7.69	135
German, furnace, f.o.b. frontier*	10.54	185
German furnace, f.o.b. frontier**	14.24	250
French foundry	8.26	145
SEMIFINISHED STEEL		
Blooms	29.04	510
Billets	31.79	560
Sheet bars	32.93	580
FINISHED STEEL		
Standard rails	34.17	600
Merchant bars	34.74	610
Angles	33.78	595
Normal beams and profiles	34.17	600
Plates, ship and tank, 10 millimeters and thicker	37.02	650
Plates, bridge and tank, 5 to 10 millimeters	37.59	660
Sheets, black, 3 millimeters	39.87	700
Sheets, blue annealed, 2 millimeters	43.28	760
Shafting, cold drawn, 40 to 60 millimeters	71.18	1,250
Bars, 2 per cent nickel steel	116.74	2,050

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	21.41	455
Basic open-hearth, Belgian	23.05	490
Gray forge, Belgian	12.70	270
Foundry, No. 3, Belgian	22.11	470
Foundry, No. 3, Luxemburg	22.11	470
Foundry, No. 3, Lorraine	22.11	470
SEMIFINISHED STEEL		
Blooms	27.99	595
Billets	30.11	640
Sheet bars	31.05	660
Wire rods	44.70	950
FINISHED MATERIAL		
Standard rails	32.94	700
Merchant bars	35.29	750
Normal beams and profiles	33.64	715
Plates, 5 millimeters and thicker	36.46	775
Sheets, black, 3 millimeters	39.52	840
Sheets, galvanized, 1 millimeter	89.40	1,900
Plain wire	56.46	1,200
Galvanized wire	65.87	1,400
Wire nails	58.81	1,250

All prices are f.o.b. furnace or works.

prices generally are regarded as purely of an emergency character, a number of agents having been warned against forward bookings at such prices, the tonnages accepted being restricted to immediate requirements. A very general view is that larger business will develop in September and October, and leading Welsh firms are asking higher prices on forward contracts. Belgium is again showing greater keenness for finished steel contracts, quoting £9 5s ($42.18) delivered for small bars, against the English figures of £10 10s ($47.88- to £11 ($50.16) for similar qualities.

Generally, the makers are insisting on the £9 15s ($44.46) price for angles and sections. Glasgow and Middlesbrough are now suffering from the effect of the boilermakers' strike in the shipbuilding industry At Barrow also shipbuilding is nearly at a standstill from the same cause. In the engineering shops a lot of work has accumulated which cannot enter into ship construction until the boilermakers get back to work. The Scotch mills generally are in need of orders, and a pessimistic view is taken there of the autumn prospects in view of the shipbuilding conditions and the inability to arrive at a settlement in continental politics. One effect of the stringency on the Clyde is the keenness of Glasgow firms to take a hand in the supply of joists and other building material in the English Midland mills at local prices despite the additional charge of something like £1 4s ($5.47) per ton in respect of railway carriage.

South Staffordshire is competing more keenly for steel rerolling, nearly every firm sharing the business, in the absence of sufficient orders for finished iron. This has brought down the price of certain steel bars from £10 ($45.60) to £9 15s ($44.46) and of steel skelp by a similar reduction to £10 5s ($46.74). The Staffordshire makers have to compete with Belgian No. 3 iron, further reduced to £9 ($41.04), and a large proportion of the nuts and bolts made in South Staffordshire are produced from this Belgian material.

In spite of a recent advance in ironworkers' wages of 7½ per cent, Staffordshire and Lancashire finished irons are further reduced, nut and bolt iron being £10 17s 6d ($49.59) and medium quality bars £11 10s ($52.44). Lancashire works are better off than Staffordshire, the bulk of the ironmaking plant in the latter district being unemployed. The sheet mills generally are rather busier, Scotland finding an improved export demand for the thinner gages and Staffordshire contributing fair quantities, particularly of highly finished surfaces, for the motor industry.

The galvanized sheet trade continues

the most satisfactory department in South Wales and there is some hope that the falling off of exports from 47,756 tons in June to 40,527 tons in July may be followed by a recovery. The leading firms are fully employed and are making good production. Prices are a shade easier on £18 10s ($84.36) basis, apparently on account of some reselling by merchants. This department expects to be busy until the end of the year.

In the tin plate trade the reduction of foreign business in July was more substantial, the exports amounting to 39,993 tons comparing with 50,281 tons in June. There is some improvement in foreign buying and the placing by the Nippon Oil Co. of Japan of one-third of its 20,000 tons order, which is divided among a number of firms, has given useful stimulus to the trade. The selling figure is maintained at £1 3s 1½d ($5.17) f.o.b. Bristol. South Wales is obviously making considerable use of foreign steel, importing last week over 6600 tons, which included 4384 tons of billets from Caen and 1922 tons of bars from Antwerp. The local price for bars continues at £9 2s 6d ($41.61), subject to the rebate under the stabilization arrangement of 7s 6d ($1.71) per ton. The amount of inquiry received appears to indicate some autumn improvement.

French Output Reduced by Occupation

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

Franc—$0.05505

PARIS, Aug. 17.—Almost seven months have passed since the French marched into the Ruhr in January. It is now possible to give some idea of the effects of the occupation on business conditions in France, particularly the iron and steel business, figures being available covering the first half of the year. The occupation undoubtedly has had an unsatisfactory effect and as a result, a certain amount of restlessness regarding the policy of the government is apparent in business circles.

As the accompanying table indicates, the production of pig iron in France during the first half of this year was 600,000 tons less than in the last half of 1922; the production of steel was 250,000 tons less. The loss in pig iron production was 21 per cent while that of steel was 10 per cent. The loss of pig iron production has been heavier because a certain amount of steel is now being made with oil fuel and in electric furnaces.

Shipments of coke from Germany to French blast furnaces decreased from 408,000 tons in December to 16,000 tons in February, increasing gradually since then to 201,000 tons in June. July receipts were somewhat heavier, but August will show a falling off owing to the gradual exhaustion of the stock of fuel in the Ruhr from which these supplies are now being drawn. Coal shipments from Germany decreased from 248,000 tons in December to 174,000 tons in June.

At the same time there has been a big rise in prices. Blast furnace coke which cost 95 francs a ton ($6.65) in December, ran up to 198 francs ($12.90) in March and is still 185 francs ($11.10), the quotation having been increased 5 francs a ton recently. This advance in prices has taken place in spite of the gradual increase in French coke production which was 130,994 metric tons in January, growing to 162,343 metric tons in May. The price of pig iron has increased from 245 francs ($16.39) a metric ton in January for No. 3 Longwy foundry iron to a current figure of 375 francs ($22.11). Steel products have advanced in proportion. The markets at present are firm, not on account of heavy business, but due to apprehension over fuel supplies. France was compelled to purchase 9,500,000 tons of British coal and coke during the first six months of this year compared with 6,00,000 tons in the last half of 1922.

Iron ore production also has declined sharply owing to the accumulation of large stockpiles. In January the production of French iron ore was nearly 2,400,000 metric tons, declining in April to 1,686,000 tons. The present production is at the rate of about 1,800,000 tons per month.

The occupation also has had an effect on prices in general other than those for iron and steel. The index of wholesale prices in December as shown in the accompanying table, was 418, the basis being 100, the average for the 10 years 1901-10. In July the index stood at 470, a rise of 52 points so far this year. Further price increases are expected owing to the depreciation of the franc which at the moment of writing is at the lowest point in its history, the franc at the middle of August being only worth 5½ cents. The rise in prices is causing heavy losses to French railroads, which are likely to finish the year with the largest deficit in their history. On the other hand the French government has been able to pay the direct cost of the occupation by the proceeds of seizures of coal, coke, dyestuffs, and iron and steel products in the Ruhr.

Germans To Fix Prices on Gold Basis

European Special Service

Mark—$0.000024

DUSSELDORF, Germany, Aug 17.—It is expected that fuel prices will soon be fixed on a gold basis, it having been found exceedingly difficult to continue even domestic transactions with German currency. Probably iron and steel prices also soon will be fixed in the same manner.

Furnace coke is now 7,536,000 marks a ton, which is equivalent only to $1.65. illustrating the futility of quoting in marks under existing conditions. Prices of pig iron, semifinished and finished steel have been advanced drastically but the exchange is so weak that the equivalent gold values are now at the lowest point yet reached. Foundry pig iron at 26,220,000 marks is equivalent only to $5.75 per ton. Billets are 36,532,000 marks ($8.00) and shapes, plates and bars range from 46,085,000 marks to 52,124,000 marks ($10.20 to $11.50) per ton.

In spite of the currency situation, imports of British coal into Germany exceeded 800,000 tons in July. The French authorities have requisitioned nine Rhine bargeloads of English coal consigned to the Phoenix works.

Business in the Ruhr district remains practically at a standstill and the total production of pig iron does not exceed 2000 tons a day. Plants in unoccupied Germany still are actively employed, and although labor troubles are becoming more frequent, the situation has been well in hand and business is being actively resumed.

Canadian Markets Are Less Active

TORONTO, Ont., Aug. 27.—The Canadian pig iron market has been without feature during the past week or 10 days. Melters are showing practically no interest in their future requirements and what demand now exists is almost entirely for small tonnages for spot delivery. The daily melt continues at about 70 per cent, but foundries still are supplied with iron that was taken in on second quarter orders and until this iron is consumed blast furnace operators do not look for any great improvement in demand. The production of pig iron is holding up well to previous levels and no furnaces have blown out during the past month. Pig iron prices are holding firm as follows: No. 1, (2.25 to 2.75 silicon) $35; malleable, $33; No. 2, (1.75 to 2.25 silicon) $32, Toronto. Montreal prices are: No. 1 and malleable, $35.50; No. 2, $34.50; Summerlee, $40; Carron, $39.

Although not as active as heretofore the demand for finished iron and steel still is good. Building steel is in demand and

(*Continued on Page* 587)

Products Move on Coast

Most Forms of Iron and Steel Find Ready Sale—Prices Stiffen in Many Lines—Prospects Encouraging

SAN FRANCISCO, Aug. 25.—Most forms of iron and steel products are moving well in the local market, though few outstanding tonnages have been reported this week. With construction activity being well maintained, especially throughout California, the crop situation showing some improvement and heavy production of oil continuing, the outlook for the balance of the year is encouraging.

Pig Iron and Coke

Little activity is noted this week in the pig iron and coke market. Sales have been confined to small tonnages and not many transactions have occurred. Dealers report that demand for coke is picking up, but no large lots are up for figures. The Whiting-Mead Co. Los Angeles, is inquiring for 1000 tons of 2.75 to 3.25 silicon iron. Prices have eased off and $35 to $36 appears to be the top of the market at present, while the larger lots, of 1000 tons or over, have been quoted as low as $32 c.i.f. duty paid San Francisco.

Bars, Plates and Shapes

Activity in the local market for bars is confined mostly to reinforcing material and buying continues in fair volume, though made up of small lots in the main. Six out of twelve open-hearth furnaces are in operation this week in this district and bar mill operators report bookings sufficient to carry them over for the next 60 days. Individual lettings of concrete bars were numerous, as far as small lots were concerned. However, over 1800 tons, in larger contracts, were placed this week.

A better tone is noted in the plate market and prices have firmed up and 3.05c c.i.f. coast ports appears to be the minimum obtainable this week, with some business going as high as 3.15c. The general run is going at 3.10c. A report from Portland states that bids are expected to be called for next week for the Bull Run pipe line job involving 17,000 tons. A fair volume of inquiry for oil storage tanks is before the trade and some awards have been made recently. The Wilshire Oil Co. placed two 80,000-barrel tanks involving 600 tons with the Steel Tank & Pipe Co. Berkeley and three 80,000-barrel tanks involving 900 tons with the Western Pipe & Steel Co. The Steel Tank & Pipe Co. secured five 80,000-barrel tanks, 1500 tons involved, from C. C. Julian and it is reported that this same interest recently placed 10 80,000-barrel tanks involving 3000 tons with the Llewellyn Iron Works. Bids will be opened on Sept. 7 by the United States Engineer Office, Portland, Ore. for six steel barges involving 300 tons. Several other awards for tanks are pending.

The only award of any size reported this week for structural shapes involved 1400 tons for the Dumbarton bridge, Hetch Hetchy project and went to the United States Steel Products Co. About 2000 tons are pending on larger awards. It is announced that construction will be begun sometime next month on a bridge over lower San Francisco bay just below Redwood City. Figures of steel involved have not yet been issued. Prices on plain shapes, as with plates, have stiffened in this section and 3.05c to 3.15c c.i.f. San Francisco is now the run of the market. Recently several fabricators have purchased approximately 1500 tons of foreign shapes from importers who have brought the material in on speculation. The price obtained for this material is reported to have been from 2.55c to as high as 2.90c c.i.f. duty paid San Francisco. At least one importer is now tentatively seeking business at 2.35c c.i.f. duty paid coast ports.

Other Finished Material

Only 500 tons of municipal awards for cast iron pipe have been reported this week, but there is some 4000 tons up for figures and pending. Pipe mill representatives report a better volume of inquiry coming in from private sources. Prices remain unchanged from those reported last week.

Standard merchant pipe continues in heavy demand. Stocks are badly broken. No premiums are being paid now for pipe. While there has been some slackening in demand for oil country goods for drilling purposes and increase is reported in pipe line material demand and sales. No large lines are before the trade, but projects calling for from a few thousand feet to several miles are numerous.

Little new business in sheets is developing and mill representatives state that they expect little until fourth quarter prices are announced. Prices remain firm, with no weakness reported, at 3.00c, 3.85c and 5.00c for blue annealed, black and galvanized sheets respectively. Interest is being displayed by consumers and distributors in what the coming announcement will bring forth as regards what prices will prevail during the fourth quarter.

The Western Pacific railroad has closed on 400 kegs of track spikes. Bids will be opened on Sept. 7 for 500 tons of girder rails for the Los Angeles Harbor commission. The Pacific Lumber Co. has placed an order with a Belgian mill for 475 tons of 70-pound rails.

Warehouse Market

Demand for out-of-stock material, according to jobbers' statements, will be larger this month than those for July. Distributors generally report a falling off in demand coming in for galvanized sheets. Plates and cold-rolled are moving well. No changes in prices have occurred.

Old Material

Movement of melting steel has not been heavy of late, mills having good stocks of supplies on hand. As a result, prices have eased off and $15 to $15.50 a gross ton delivered is the general price being paid for this class of material. Cast iron scrap is in good demand and appears to be firm at around $26 a ton delivered.

Northwest Sees Pick Up

SEATTLE, Aug. 25.—There is an optimistic tone to the iron and steel market in this territory, the trade feeling that the worst of the dull season is over. Throughout the midsummer lull prices have held fairly firm and little price cutting has been reported. It is believed that the trade is on the verge of a buying movement that will carry well on into the winter.

Building holds up well, new projects of large proportions being announced almost daily. The lumber industry is active operating at full capacity, excellent crops are about to be marketed and conditions as a whole indicate continued good demand for iron and steel products. Puget Sound Power & Light Co. will erect at once a 3-story steel and concrete substation to cost $50,000. During the last week contracts have been awarded, bids opened or construction announced on seven projects totaling $500,000.

Increased activity at the steel marine repair yards on the north coast is due to the award of two large repair contracts. The Albina Marine Iron Works was given the job of repairing the Japanese steamer YONAN MARU on a bid of $137,680, forty days, while Todd Dry Docks, Inc., Seattle, will rehabilitate the damaged Japanese steamer MANDASAN MARU on a bid of $20,000, time ten days.

Pig Iron and Coke

Pig iron has developed a firmer tone in sympathy with stronger prices both in Great Britain and in the eastern domestic market. The best grades of Glengarnock are still quoted at $36 here, duty paid, but importers think the bottom has been touched and any further changes will be upward. Some cheap continental iron has been offered but it does not test well, being high in sulphur and phosphorus. Good continental iron is hard to obtain at present. Foundries in Washington and Oregon are generally busy but a majority of plants have fair sized stocks of pig iron still on hand. The largest importing house here is carrying between 300 and 400 tons of high grade iron in stock so that it is not expected any sizable orders for new iron will be placed until the end of the year. There is no change in the coke situation, local Wilkeson and Fernie from British Columbia supplying the trade. There is no demand for foreign coke.

Bars, Plates and Shapes

This market shows fair activity, there being a sustained demand for bars while

plates are moving in increased volume. The Pacific Coast Steel Co. is operating two of its four open-hearth furnaces reporting considerable work on the books. There is no weakening in prices, merchantable bars remaining firm at 3.20c. This company has just been awarded the contract for about 900 tons of reinforcing steel for the new state capitol building at Olympia. Most of the tonnages coming in are in lots under 100 tons, many orders being in car lots. Foreign inquiry is slack although during the week quotations were forwarded by local exporters on 150 tons of reinforcing steel for China. Reports from that country state that much buying may be expected as soon as political conditions become stabilized.

Other Finished Material

Although jobbers in this territory have not revised their price lists for several weeks, track spikes were reduced from 4.75c to 4.50c this week. This action was taken to offset some sporadic cutting and is expetced to stabilize the trade. There is a good demand for track spikes. Sheets appear to be coming into their own as the turnover of this item has increased noticeably this month. Heavy shipments of iron and steel products are still arriving from eastern centers by water and jobbers' stocks as a result are in good shape.

Old Material

Conditions in this market are unchanged from last week. Demand is at a minimum. It is a buyer's market so that quotations are unstable. However, steel scrap may be said to be worth about $11.50 and No. 1 cast iron $20 to $22. Dealers have very little stock on hand but under present conditions they find no incentive for replenishing.

Canadian Market Inactive

(*Continued from Page* 585)

orders for shapes, beams and reinforcing bars closed during the past few days showed good tonnages. Shapes and beams are unchanged at 2.70c, Toronto. The demand for bars fell off slightly, but mills still are closing orders for spot delivery. The Hamilton mills are well supplied with orders for bars and are assured of continued operations in this department up to the end of next month at least. Bars are quoted at 3.10c, Toronto. Additional contracts for rolling stock placed by the Canadian National and Canadian Pacific railways have somewhat strengthened the demand for plates, while boiler and tank builders also are showing renewed interest in their requirements. Plates are firm at 2.60c, Toronto. A steady demand for sheets is reported but buying is confined almost entirely to spot delivery. Mills are in a position to give immediate delivery on new sheet business and consumers and dealers are taking advantage of this opportunity to replenish stocks. No. 28 black sheets are quoted at 4.60c, No. 10 blue annealed 3.75c, and No. 28 galvanized 6.00c, Toronto.

Canadian dealers report a slow demand for iron and steel scrap.

Ralph C. Gardner, founder, doing business as the Gardner Co., Lynn, Mass., has filed a petition in bankruptcy.

Britain Increases Exports to United States

European Staff Special

London, Aug. 18.—Figures issued by the board of trade covering the first six months of this year show that British exports to the United States have increased considerably compared with 1922, while imports from the United States to England have diminished. Bankers and economists attribute this partly to the effect of the British debt-funding agreement, the tendency of which is to stimulate exports to the United States and restrict buying therefrom in order to build up dollar credits in New York. The relatively high prices which have prevailed in the United States are also an important factor.

For the first six months of 1923 exports from Great Britain to the United States were valued at £31,400,000 ($143,300,000) compared with £24,800,000 ($113,200,000) in the first half of 1922. Re-exports in the first half of this year were valued at £17,600,000 ($80,300,000) compared with £10,400,000 ($47,500,000) last year, a good deal of this being accounted for by increased American purchases of tin and rubber. Since British prices this year are generally lower than last these figures indicate that the volume of exports from Great Britain to the United States has increased over 25 per cent. Included with this were over 130,000 tons of pig iron and 60,000 tons of ferromanganese.

The volume of imports from America, however, has decreased over 7 per cent, this being mainly confined to wheat and meat products. The value of British imports from America in the first half of this year was £103,100,000 ($482,000,000) compared with £111,200,000 ($520,000,000) last year.

The figures of the board of trade also show that British business with Germany has increased extensively in spite of the depreciation of the mark. Exports from England to Germany in the first half of 1923 were valued at £20,800,000 ($95,000,000) compared with £14,200,000 ($65,000,000) in 1922, most of this being due to German buying of English coal and pig iron. Re-exports from England to Germany were £10,400,000 ($47,500,000) for the first half of this year compared with £10,200,000 ($46,600,000) in 1922. British imports from Germany were valued at £16,900,000 ($77,250,000) in the first half of this year as compared with £12,000,000 ($55,000,000) last year.

The total value of British exports for the first six months of 1923 was £382,700,000 ($1,750,000,000) compared with £351,800,000 ($1,610,000,000) in the first half of 1922. The total re-exports in the corresponding periods were £118,800,000 ($543,000,000) and £104,800,000 ($475,000,000). Out of the total exports, 38 per cent are going to British dominions at the present time, together with 54 per cent of the re-exports.

Japan Imports Machinery from America

Japanese machinery imports from the United States and Great Britain are shown in a recent report of the industrial machinery division of the United States department of commerce. The report shows the comparatively insignificant part played in this business by the United States in earlier years; the phenomenal growth in American participation in certain lines with a corresponding waning of the British volume; and the subsequent regaining in some cases by the British of ground lost. In many lines, however, the American manufacturers are retaining their hold and even increasing their standing though the British have regained their former prestige. This condition is possibly due to the fact that in those lines of endeavor where the original machinery installed was of British make, the repairs and replacements necessarily came from the same country.

In the earlier years the British controlled the market but in the first part of 1915, owing probably to the war demands on the British manufacturers, their participation in this business fell to a negligible quantity, while American business took a sharp upward trend. American metal and wood working machinery gained in favor to 1920, and although the American participation thereafter felt the effects of the general depression after the war, an examination of this type of machinery imported into Japan shows that it is almost exclusively American made. In 1913 the British held control in the majority of items, their percentage being 48.4 as against the American percentage of 8.7 of the total imports of machinery. By 1920 the situation had altered until the British percentage was only 20.6 as compared with the increased American percentage of 51.4.

Many of Japan's new industries that sprung up during the war and which purchased machinery from this country have found it unprofitable to operate under present conditions and have either failed entirely or have closed down waiting for better times. This process of elimination has been rather castly and has thrown on the Japanese market a fair amount of slightly used machinery which must be disposed of before fresh imports are sought.

IRON TRADE REVIEW

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Europe Still Biggest Market

THE European situation has been and continues one of the blackest blots upon the fair horizon of the economic outlook. All modern industrial nations are bound together in a closely drawn web of commerce and finance. With one vast portion of this world unit plunged into the depths of poverty, the prosperity of the whole inevitably will be affected. However, the extent of the effect of Europe's present plight upon American business probably has been overestimated by many observers. It is not likely that transatlantic conditions will ever entirely outweigh domestic factors making for good times. But these factors may be modified by adverse foreign developments.

In 1922 the recovery in this country gathered great momentum despite unfavorable conditions abroad. But since 1922 Europe has sunk lower and lower in the economic scale. The results of the Ruhr occupation are now being felt with full force in Germany. That country has seen its paper currency reduced to utter worthlessness, and its purchasing power abroad is correspondingly weakened. Until the Ruhr seizures Germany continued a fair buyer of American farm products and of copper. Great Britain lays her present industrial stagnation to the situation upon the continent. Germany and England are at once great competitors and customers of the United States. Prosperity for them is far better for this country than economic unsettlement.

Some people are inclined to take the attitude that European markets are of little importance and that American exporters should turn to other sections of the globe. This they are doing, but the field is limited. This fact is brought out by government officials in close touch with export activity who feel that too much attention has been given to the promotion of American foreign trade with South America and Asiatic countries to the detriment of our trade with Europe.

It is pointed out that the European area is still the largest customer of the United States. Exports to Europe cannot be neglected. In 1922, according to department of commerce figures they amounted to 54 per cent of our total foreign sales, almost half of these sales being to the United Kingdom. Fifteen per cent went to Germany. France took 13 per cent and Italy 7 per cent. During the first six months of 1923 Europe purpchased 50 per cent of the exported products of our agriculture and industry. It takes 75 per cent of our farm products. It is in its effect upon agriculture that the European situation is most serious.

One-half of the cotton crop and one-third of the wheat crop are normally shipped abroad, in addition to large sales of meat and other farm products. Reduced purchasing power abroad is one of the chief causes of the present lack of prosperity among certain important groups of farmers. Neither an unsettled Europe nor low wheat prices are sufficient to block trade activity this autumn, but it is certain that the speed of industry would be much greater were European affairs to be straightened out. It is indisputable that any settlement of the reparations tangle would be the most constructive economic event since the armistice.

Visiting Foundrymen Abroad

MEMBERS of the American Foundrymen's association, who arrived in London last Saturday on the first lap of the tour through England, France and Belgium were warmly greeted by distinguished members of the foundry and iron and steel trade associations of England. According to IRON TRADE REVIEW's special cable, the principal speaker at the dinner of welcome at the Hotel Cecil stressed the significance of the presence of the American foundrymen in Europe. "In a three-part mold, representing America, France and England," he is reported to have said, "we are casting the full pattern of international amity."

The present tour recalls a number of previous attempts by America's professional and business men to visit their European contemporaries in a body. One

of the most successful trips of this kind was that arranged by the American Society of Mechanical Engineers, on which occasion many engineers and manufacturers visited the great industrial centers of Germany in the height of their prewar activity. Small parties frequently have inspected plants of European industries, and a constant flow of individuals bent on observing conditions across the sea, is maintained between European nations and the United States.

Up until a year ago it would have been difficult without an actual check-up, to say whether Americans or Europeans dominated in this friendly migration to foreign shores. Today the trend is unmistakably eastward.

Every encouragement should be given these tendencies to bring the metal working industries of the world in closer contact. Foundrymen from France, Belgium, England and the United States and Canada should become familiar with the problems and opinions of their foreign contemporaries. International bonds should be strengthened socially and in a business way, so that when the serious task of formulating world-wide standards is undertaken, a basis of understanding will have been established that will go far in facilitating negotiations.

Cost of Service Will Govern

WITH the transcontinental railroads seeking permission to make through freight rates on commodities from Chicago and mid-west territory to Pacific Coast points lower than the contemporaneous rates to intermediate points the interstate commerce commission is again presented with the opportunity of preserving water transportation and confronted with the necessity of absolutely divorcing it and rail transportation.

Prompting the desire to lower rates in contravention of the long and short haul clause of the fourth section of the interstate commerce act is the inroad of Panama canal competition. Manufacturing plants along the eastern seaboard have been able, by grace of the canal, to ship their products to the west coast at a lower cost than competitive plants inland which are geographically much nearer the consumer. The proposed reduced rates from Chicago and allied points would meet this competition via the canal.

The hundreds of millions of dollars voted by congress to blast and dredge a ribbon of water across the Isthmus of Panama were released from the treasury by the will to provide cheaper transportation. The very purpose was to bring the east and west coasts nearer each other, the accomplishment of which appears to be borne out by the tactics of the transcontinental lines. There was no thought of punitive damage to the transcontinental lines; they have a territory to serve and a sphere in which to revolve which the canal can never restrict.

It is trite to observe that a longer rail haul costs more than a shorter one. The fourth section of the interstate commerce act is proof positive of congress' intention to terminate this sort of discrimination. A railroad is in business to make money. Theoretically, every rate should return the cost of service plus a fair profit. If one rate is under the cost of service then other rates must not only recoup the loss but must also pile up an additional profit.

The theory that rail transportation must compete with water transportation has cost American industry immeasurably. Build up the chain of circumstances that follow when a rail rate is lowered to meet a water rate. The traffic that would have gone to the water carrier naturally is diverted to the swifter rail carrier. This traffic is carried by the railroad at a loss, for water costs invariably are much lower than rail costs. To offset this rail loss, to say nothing of the surrendered profit, rail rates in regions not blessed by water transportation or even the suggestion of it, must be increased disproportionately to the normal level.

This question of water and rail transportation is by no means one-sided. The manufacturer in the Middle West who sees his business in the West taken away by his eastern competitor who is able to use the Panama canal is naturally inclined to question the cost-plus theory of rail rates. But in the long run it is obvious that this is the basis to which railroad rates must settle. Every manufacturer seeks to place every one of his products on its own feet and eventually every railroad rate must be based upon something approaching the cost of service.

Complete and Accurate

Readers' Views of IRON TRADE REVIEW—"Beyond Compare" on Markets

WE HAVE been a subscriber to IRON TRADE REVIEW for about one year, but it has been a great help to us in various ways. We are especially interested in your Business Trend section, and we are pleased to say that we have found it to be very reliable. From the standpoint of manufacturers' representatives, we feel that all information which is useful to us is contained in your magazine.—*E. D. Williamson, Mid-Western Sales Corp., 225 Parsons St., Detroit.*

"You have finally convinced the writer that IRON TRADE REVIEW is beyond compare on the present-day market. I refer to the Business Trend, as explained by your experts. We have taken this up at various times with the bankers' reports throughout the eastern district and we find them exceptionally accurate. Therefore, you need not hesitate to tell your good friends that we are very much pleased to recommend this magazine to be one of the best current issues published today."—*J. H. Wood, president, Eastern Machinery & Equipment Co., Inc., 830 Commerce Trust Bldg., Philadelphia.*

The graphs contained in your Business Trend section I have found of considerable interest.—*C. P. Marsh, Cleveland Union Terminals Co., Cleveland.*

Commodity Prices Are Firmer

Iron and Steel Prices Stop Decline and Many Other Commodities Likewise Begin To Stiffen—Reflects Change in Trade Sentiment as Buying for Autumn Begins—Farmers Hold Grain

BY JOHN W. HILL, FINANCIAL EDITOR

THREE elements of uncertainty in the business outlook have been the probable extent of autumn trade revival, the outcome of the hard coal miners negotiations and the European situation. The turn in trade sentiment came about three weeks ago with a larger buying movement in a number of important lines. This has not assumed great proportions thus far, and it were better if it does not. A rush of purchasing now with accompanying rapid climb of commodity prices would be to repeat last spring's hesitation later.

At the moment it appears that there will be a normal fall activity over the next few months. In some lines curtailed output and reduced dealer buying, together with large consumption have brought stocks to a reduced state. This is forcing purchases now. Some trade observers in textile lines assert that dealers have not covered anything like their consumer needs for autumn and a large volume of reorder buying is predicted. In the iron and steel industry demand has increased, but runaway markets are not likely to develop in the immediate future.

The most significant feature in iron and steel has been the halt in the decline of prices which had continued steadily for 12 weeks. As shown by the Business Trend the IRON TRADE REVIEW composite market average of 14 iron and steel prices now stands 36 per cent above the low point of the recent depression in March 1922. They are 70 per cent higher than the 1913 average, and 6 per cent under the top price for 1923, reached in May. Concurrently with the stiffening of iron and steel have come firmer wheat, corn, livestock, rubber, and cotton. The weekly wholesale price index compiled by Prof. Irving Fisher of Yale university, advanced 2 points last week. It has been falling for many weeks. These developments leave no doubt of a turn.

The stock market also has been showing underlying strength. It has recovered a part of its losses recently. Unfavorable news has not caused any further decline, the markets merely marking time. Betterment in values for agricultural products is important because of the discontent among farmers. Livestock has touched the highest point for the year. Railroad loading reports show that 3000 less cars weekly are being used for grain than one year ago.

Farmers are enabled to pursue orderly marketing by the plentitude of credit avaliable both for farmers and for industry. Funds have been moving into the interior from the East, but there has been no perceptible tightening of loan rates. The fall may bring some slight stiffening in rates, however, depending upon the extent of trade revival.

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Iron and Steel Production Rate	Feb. 1
Long Time Trend of Wages	Aug. 3

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	324	348	372	368	...
Cash ratio Fed. Res. System	77.9	77.3	78.2	79.6	...
Loan rate. 4-6 Mo. N. Y. (per cent)	5	5	5	4	5¼-6
Average 25 ind'l shares	$104.72	$104.81	$101.29	$103.68	$58.19
Average 25 rail shares	$56.69	$57.23	$56.54	$67.64	$82.97
Av. 40 bonds	$76.70	$76.64	$76.49	$81.92	$93.00
Car loadings (week ended Aug. 11)	973,162	1,033,170	1,019,667	842,690	*971,269
Bank debits 247 cities (000 omit'd 1920)	$8,182,305	$7,420,079	$9,273,000	$7,749,126	.....

*1920

FOREIGN EXCHANGE (Demand)

	Normal	Aug. 20 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.54	$4.54	$4.59	$4.46
Franc	19.3c	5.69c	5.55c	5.98c	7.55c
Lira	19.3c	4.33c	4.30c	4.37c	4.31c
Mark	23.8c	0.000017c	0.000014c	0.0002c	0.05c

MONTHLY COMPARISON

	July	Month before	Year ago	Monthly average 1913
Dodge building Awards in 36 states	$315,024,000	$371,034,000	$415,000,000	$82,126,000
Business failures: Number	1231	1358	1753	1336
Liabilities	$35,721,188	$28,678,276	$40,010,313	$22,732,000
Exports	$310,000,000	$320,000,000	$361,157,000	$207,000,000
Excess of gold imports	$27,406,000	$18,885,000	$42,343,000	†630,716
Bureau of Labor Price Index	151	153	156	100
Bradstreet's Price Index	138.7	141.5	130.5	100
Economist's British Price Index	4182	4301	4396	2717
Cost of Living Index	161.0	160.1	155.6	100
New incorporations	$724,920,000	$1,403,336,000	$634,259,000	$172,301,000
Railroad net earnings	*$87,742,000	$89,999,600	$76,271,000	$59,900,000

†Monthly average excess exports. *June.

The Business Trend

August 30, 1923

TRADE TODAY, TOLD BY IRON TRADE CHARTS

GENERAL SITUATION—Underlying strength of general business structure gradually asserting itself; demand broadening cautiously in numerous lines as autumn approaches; coal strike threat and European deadlock have been disturbing factors; overproduction exists in a few industries, but stocks are thin in many lines.

IRON AND STEEL PRICES—After 12 weeks of steady decline Iron Trade Review composite price average stiffens; level now 70 per cent over 1913 average; 36 per cent above March, 1922; down 6 per cent from 1923 top.

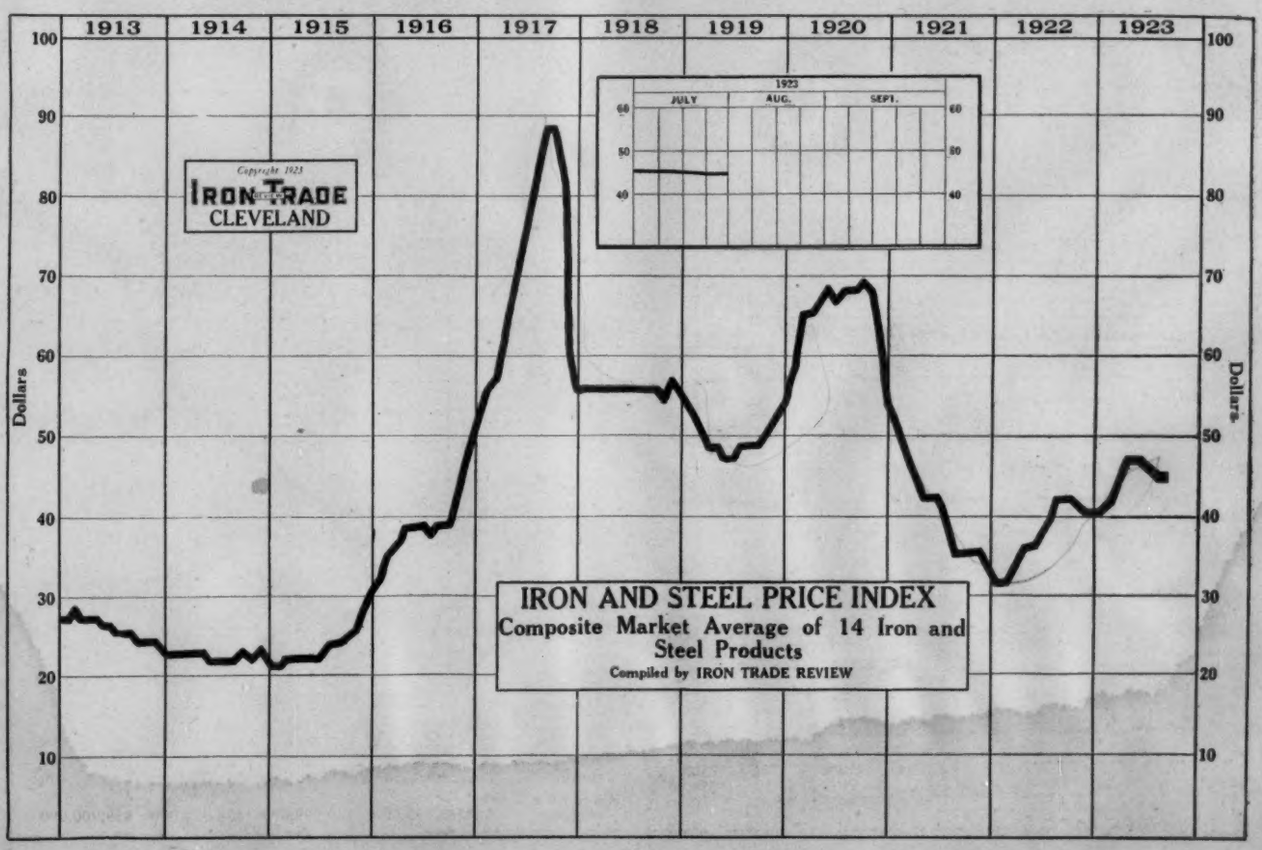
BANK CLEARINGS—Check exchanges show seasonal decline; total outside of New York in July increased 14.5 per cent over 1922; with prices down 2 per cent this reflects big physical volume of trade.

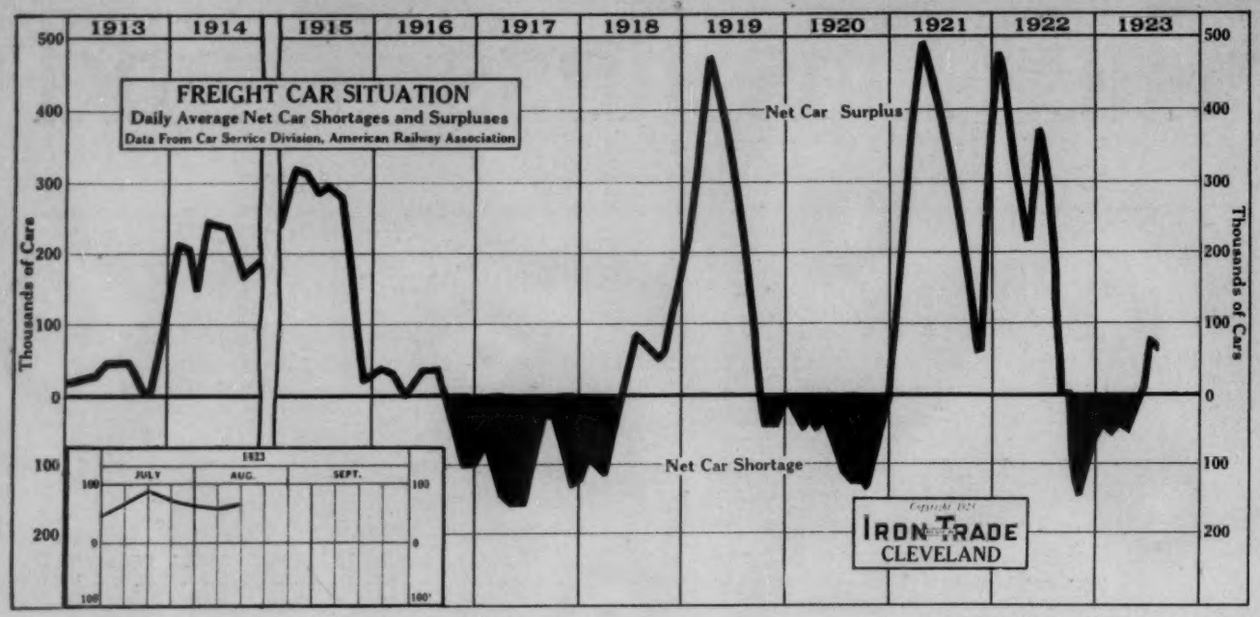
ELECTRIC POWER—Enormous manufacturing activity shown by continued heavy consumption of electric power; June production of 151,000,000 kilowatt-hours exceeds that for May.

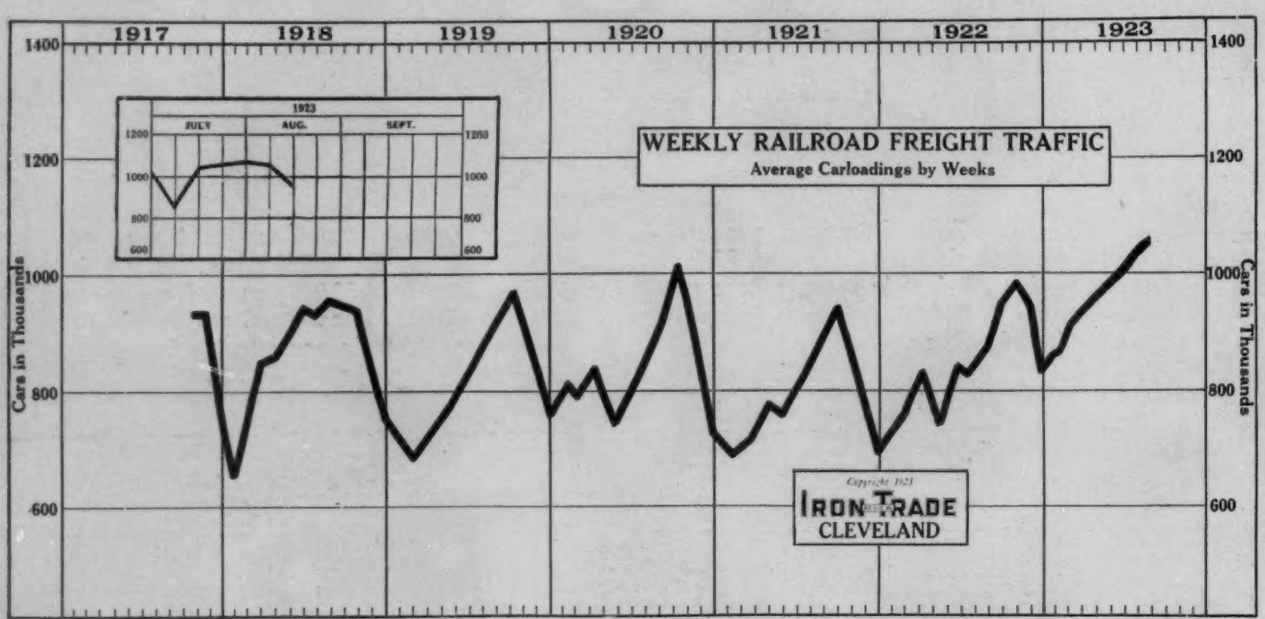
COKE PRODUCTION—July output of by-product coke of 3,255,000 gains slightly over June; beehive production of 1,755,000 tons declines 10 per cent; rate of output less than any recent year save 1921 and 1922.

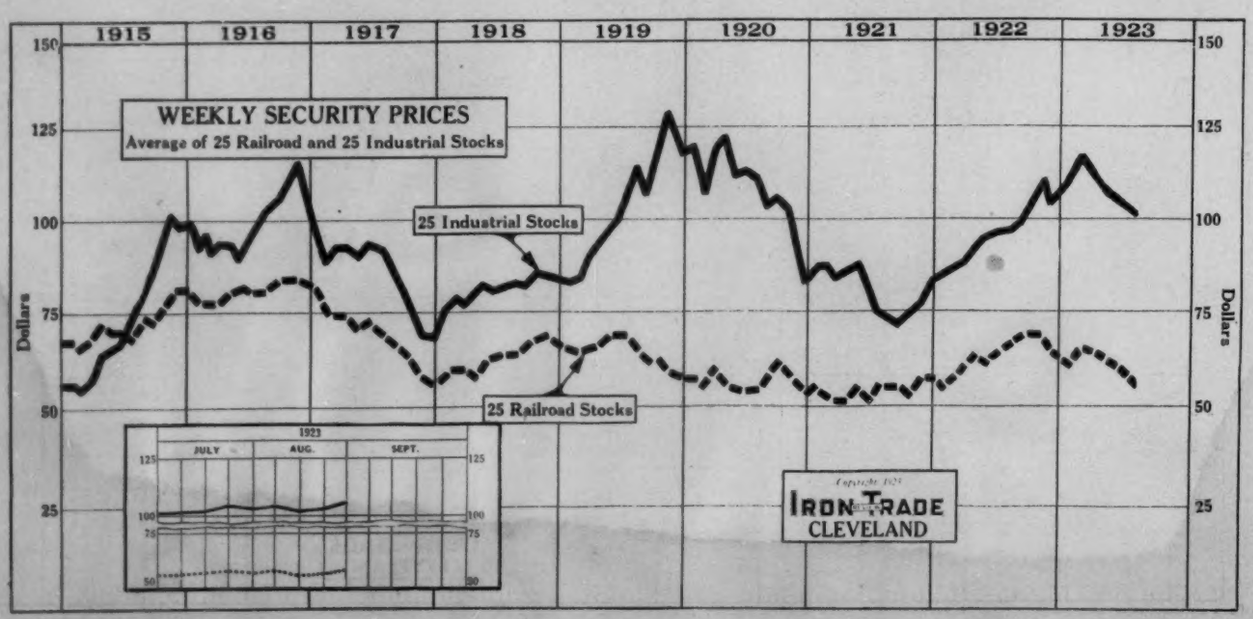
STRUCTURAL AWARDS — Fabricated structural steel sales in July continue decline; portion of shop capacity represented was 50 per cent against 51 per cent in June and March peak of 95.

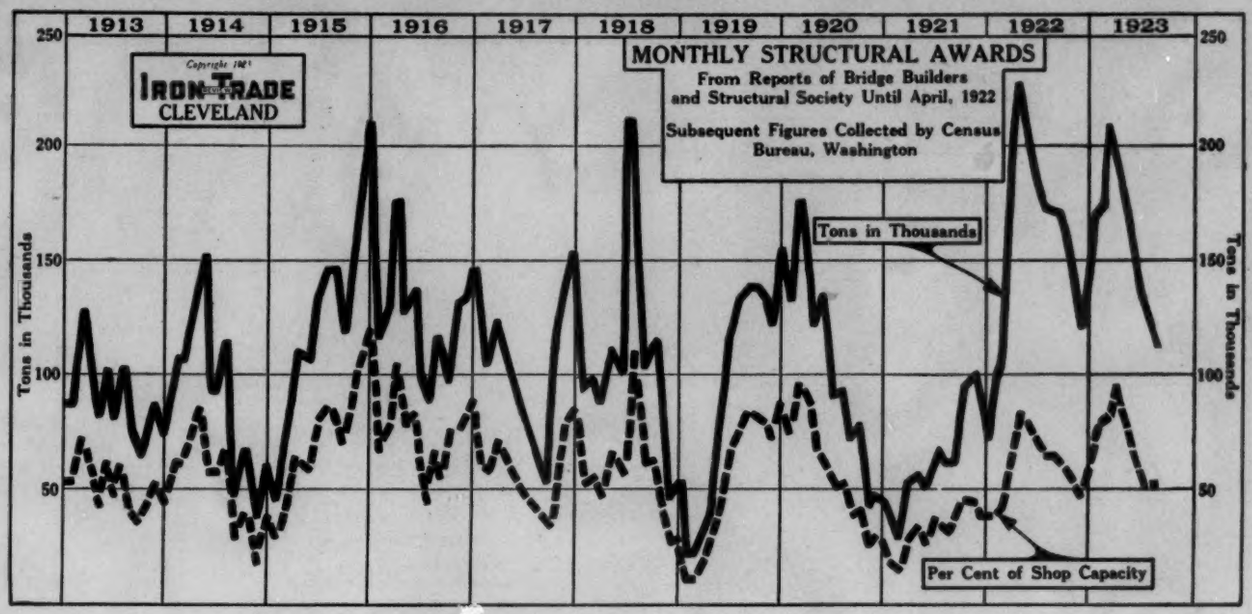
FREIGHT TRAFFIC—Car loadings of 973,162 in week ended Aug. 11 show sharp drop of 60,000 cars from preceding week; decrease reflects President Harding's funeral; car surplus large.

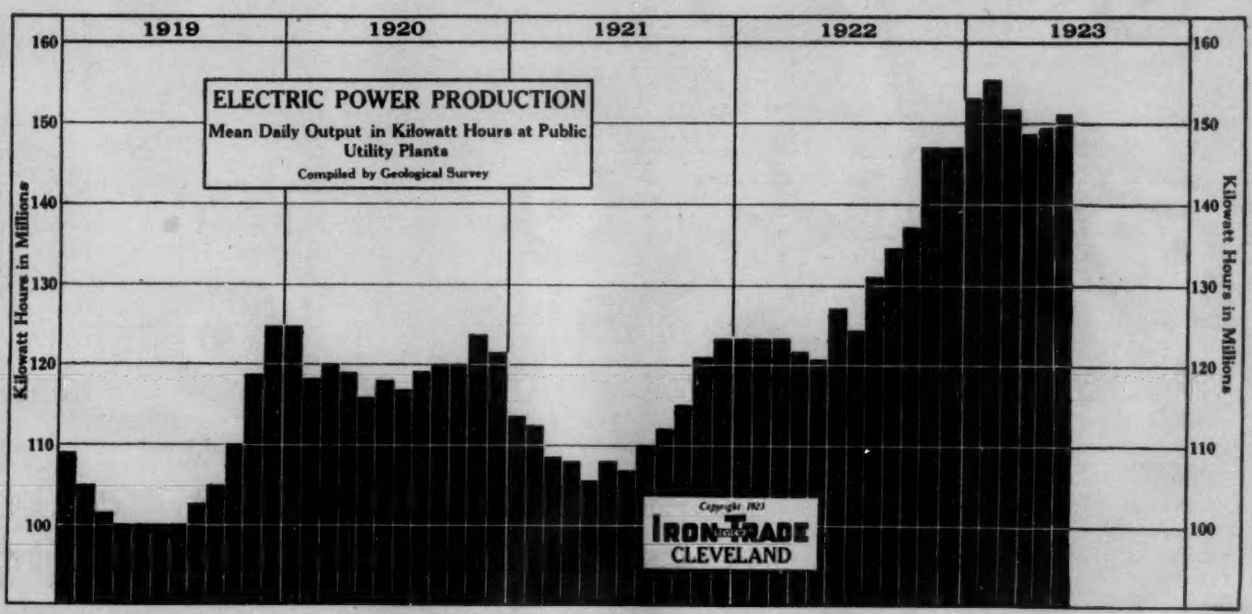


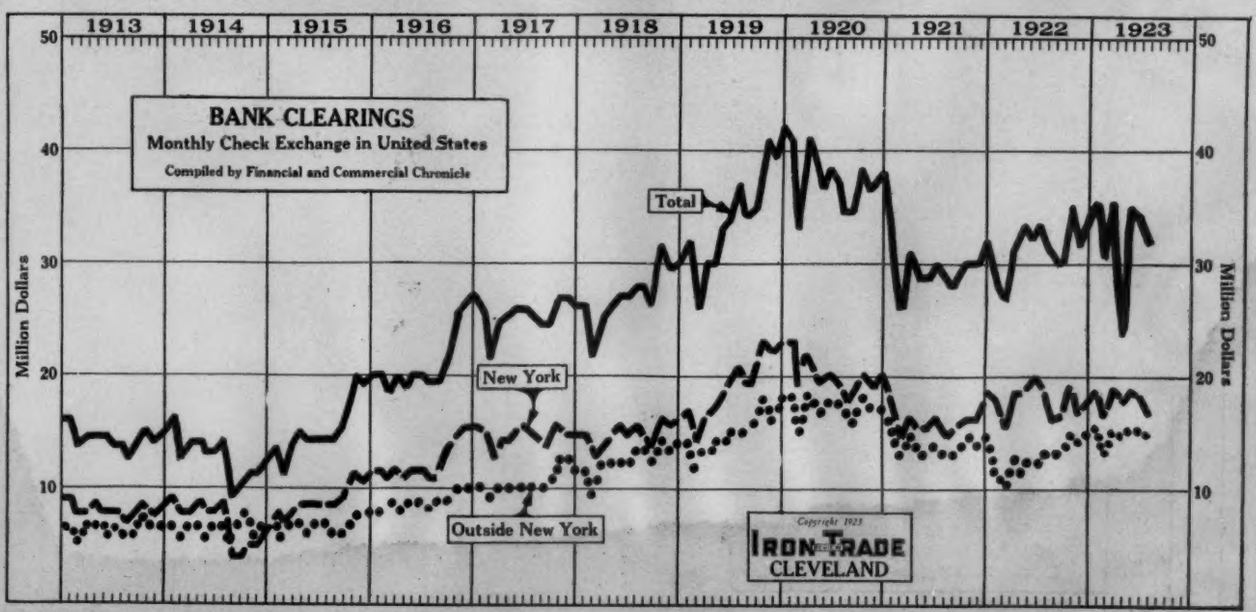

1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
Thousands of Cars
500
400
300
200
100
0
100
200
1923
JULY
AUG.
SEPT.
IRON TRADE
CLEVELAND

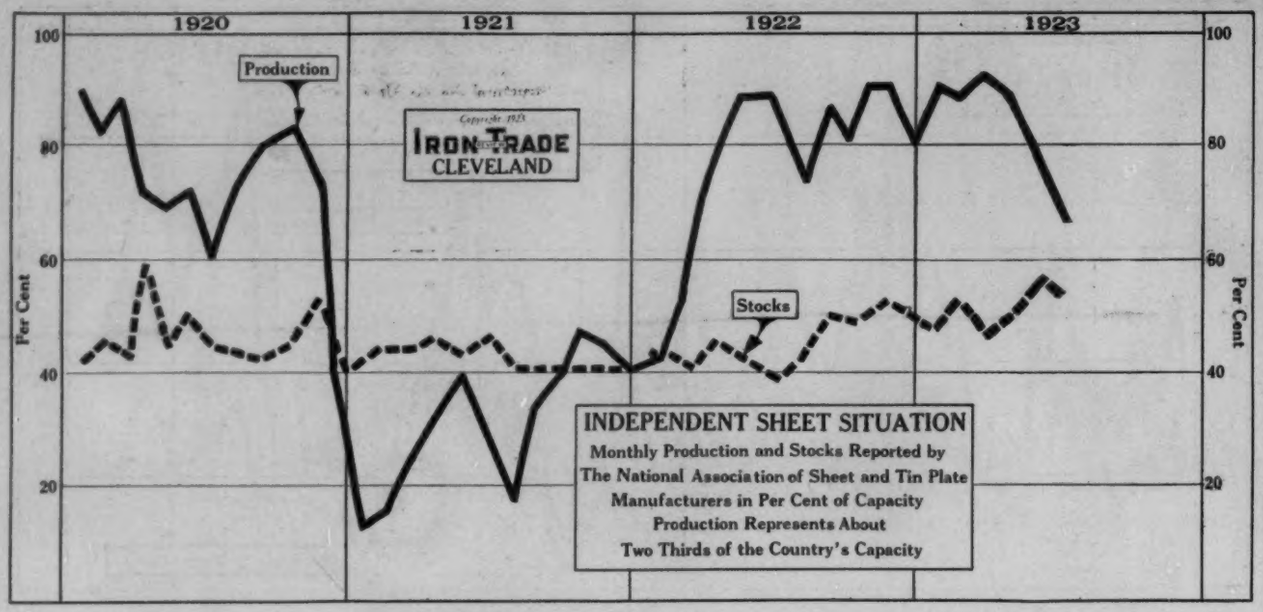

1917
1918
1919
1920
1921
1922
1923
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Cars in Thousands
1400
1200
1000
800
600
1923
JULY
AUG.
SEPT.
IRON TRADE
CLEVELAND

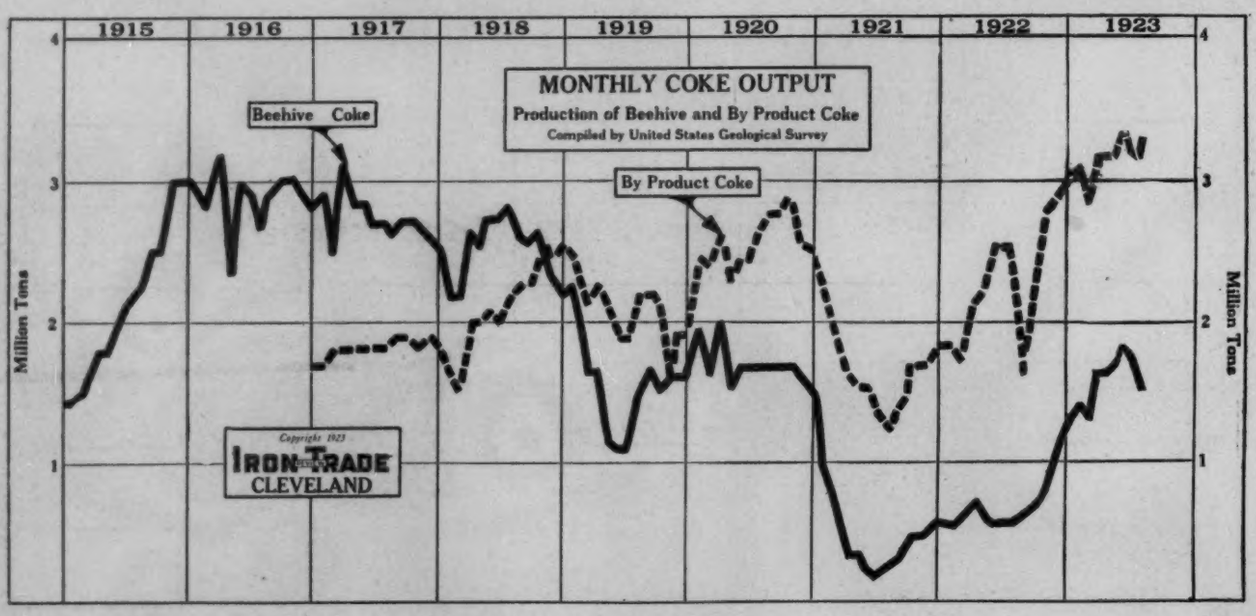

1915
1916
1917
1918
1919
1920
1921
1922
1923
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
Dollars
150
125
100
75
50
25
1923
JULY
AUG.
SEPT.
IRON TRADE
CLEVELAND

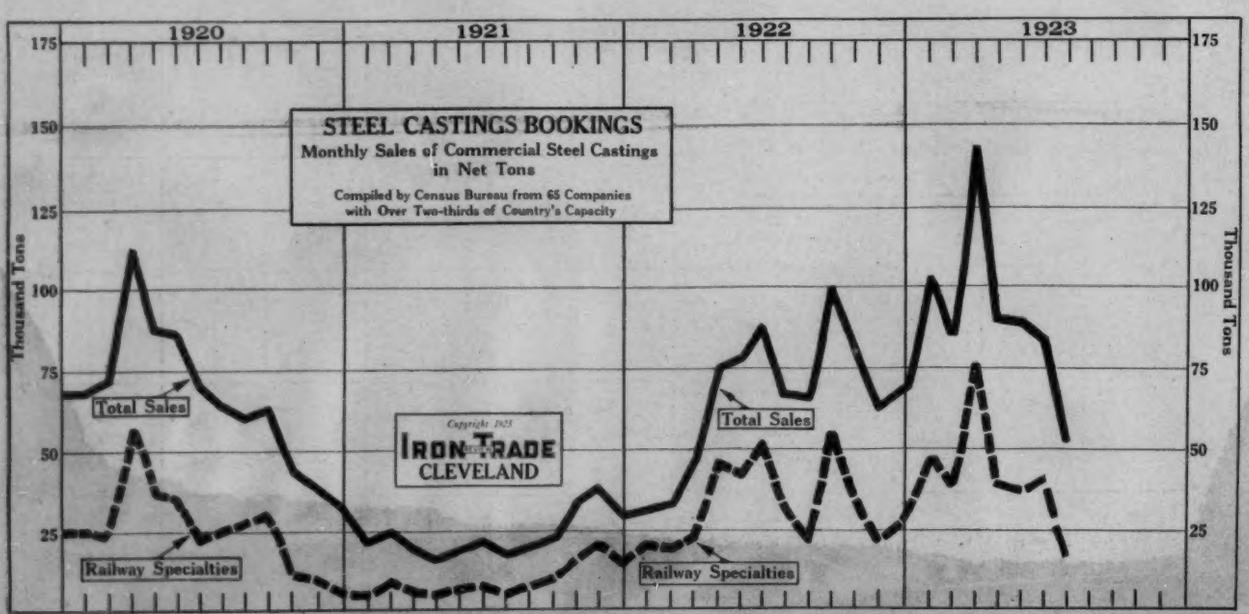

1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
250
200
150
100
50
Tons in Thousands
MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society Until April, 1922
Subsequent Figures Collected by Census Bureau, Washington
Tons in Thousands
Per Cent of Shop Capacity
IRON TRADE
CLEVELAND


1919
1920
1921
1922
1923
160
150
140
130
120
110
100
Kilowatt Hours in Millions
ELECTRIC POWER PRODUCTION
Mean Daily Output in Kilowatt Hours at Public Utility Plants
Compiled by Geological Survey
IRON TRADE
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
50
40
30
20
10
Million Dollars
BANK CLEARINGS
Monthly Check Exchange in United States
Compiled by Financial and Commercial Chronicle
Total
New York
Outside New York
IRON TRADE
CLEVELAND


1920
1921
1922
1923
Production
Stocks
Per Cent
100
80
60
40
20
IRON TRADE
CLEVELAND
INDEPENDENT SHEET SITUATION
Monthly Production and Stocks Reported by
The National Association of Sheet and Tin Plate
Manufacturers in Per Cent of Capacity
Production Represents About
Two Thirds of the Country's Capacity


1915
1916
1917
1918
1919
1920
1921
1922
1923
MONTHLY COKE OUTPUT
Production of Beehive and By Product Coke
Compiled by United States Geological Survey
Beehive Coke
By Product Coke
Million Tons
4
3
2
1
IRON TRADE
CLEVELAND


1920
1921
1922
1923
STEEL CASTINGS BOOKINGS
Monthly Sales of Commercial Steel Castings
in Net Tons
Compiled by Census Bureau from 65 Companies
with Over Two-thirds of Country's Capacity
Thousand Tons
175
150
125
100
75
50
25
Total Sales
Railway Specialties
IRON TRADE
CLEVELAND

Making Iron from Ore by a New Electrolytic Process

BY E. C. KREUTZBERG

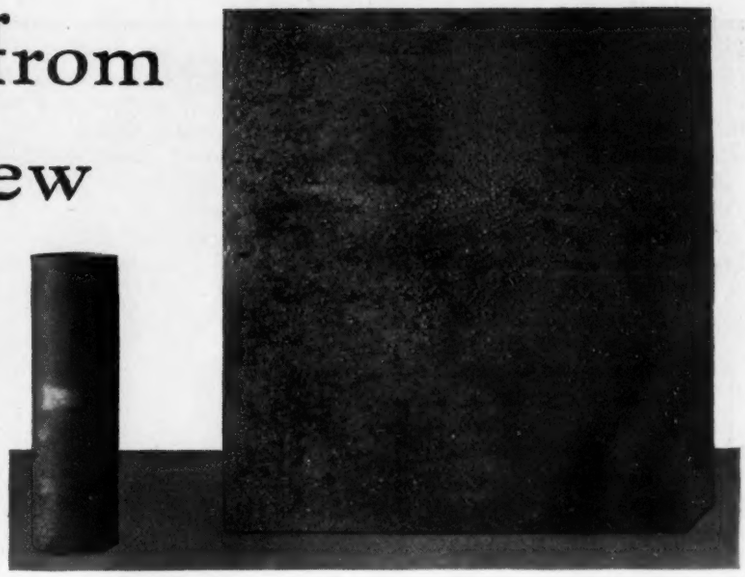


Fig. 1—A 2 x 2-foot plate and a 4 x 12-inch tube made by electrolysis of pure iron

AFTER extensive research work over a period of four years, pure iron is being made by electrolysis at the plant of the Milford Electrolytic Iron Co., Milford, Conn. Of outstanding importance is the fact that the product at Milford is being obtained from iron ore. The process thus opens up to exploitation large deposits of iron ore of a character unsuited to blast furnace reduction, and adds greatly to the world's potential iron-making capacity.

Although electrolytic production of iron dates back as far as 1846, it is only within the last few years that the method has proved a commercial success. The Societe le Fer, Grenoble, France, was a pioneer in applying the method on a tonnage scale. It took out its first patents in 1910 and since 1915 has been producing pure iron tubes on a commercial scale. More recently, the research departments of the American Telephone & Telegraph Co. and the Western Electric Co. developed the manufacture of pure iron at Hawthorne, Ill., where they have capacity for producing about two tons a day. Both at Grenoble and at Hawthorne the processes differ somewhat from that developed at Milford. The most notable difference is that the former processes produce electrolytic iron from cast iron instead of directly from ore.

The author is associate editor at New York of IRON TRADE REVIEW.

The development at Milford originated in a visit at Grenoble by Charles Page Perin when the latter was studying the resources of Europe in 1919 at the request of the British government. Mr. Perin and his associate, F. A. Eustis, were interested in some ore properties in Cuba and they thought that electrolysis could be applied successfully to their mineral. Most of the intervening time has been spent by Mr. Eustis in developing the new process, which bears his name.

While intended only as a pilot plant to furnish the experience that will serve as the basis for the erection of plants at more favorably located points, the Milford establishment is equipped to dissolve 2½ tons of ore per day. Owing to the continuance of experimental work, both with respect to the design

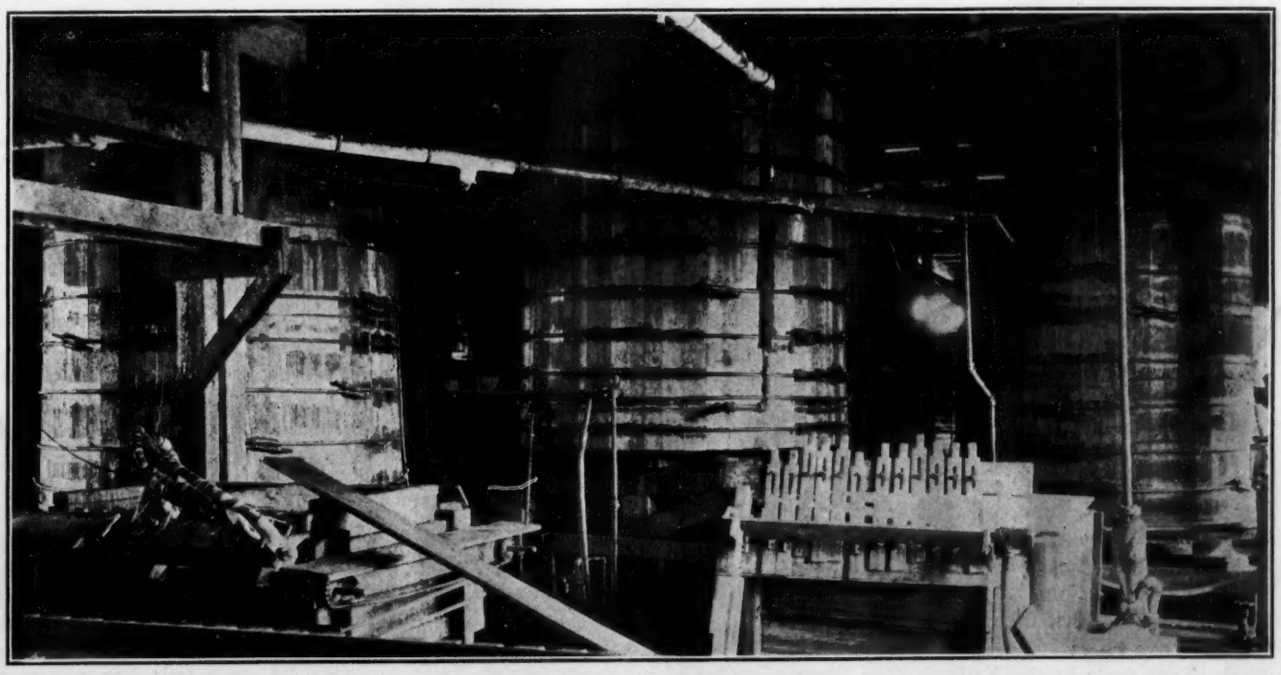


FIG. 2—LEACH HOUSE AT PLANT OF MILFORD ELECTROLYTIC IRON & STEEL CO., WHERE FERROUS CHLORIDE IS MADE BY DISSOLVING IRON ORE

and construction of equipment and testing various kinds of ores, present operations are at the rate of half a ton of ore per day. Widespread interest in the new process has been aroused among mine owners all over the world who are submitting samples of their deposits. Ores from Norway, Finland, Italy, Mexico and the state of Washington now are being tested. Regular production now is being obtained from pyrrhotite from southern Quebec and the extensive experience obtained at the plant shows that the most favorable results with the new process can be had from pyrrhotite or pyrite ore located where cheap water power is obtainable.

Iron produced by the Eustis process averages over 99.9 per cent pure. Its only serious impurity, hydrogen, which is deposited along with the iron, easily is eliminated by annealing. The resulting product is as soft as copper and aluminum and has greater ducility and cold-working ability than either of these metals. In fact, because pure iron has been available only in the last few years, it is only recently that the merits of this product have been thoroughly understood. Tests made by the National Tube Co. on iron tubes 99.97 per cent pure, produced at Grenoble, showed a tensile strength in the direction of rolling of 62,000 pounds per square inch and elongation of 12 per cent in 8 inches. After being redrawn and annealed, the same tubes showed 39,000 pounds per square inch tensile strength and 30 per cent elongation in 8 inches.

Tests made in France and in this country and substantiated by work of the Stanford Steel Products Co., Milford, on iron made by the Eustis process, show the cold-working properties of electrolytic iron to be remarkable. The pure iron is extremely ductile and becomes harder and stronger with cold working, but the hardness does not exceed a certain point. In cold working it is not necessary to anneal pure iron nearly as often as iron and steel of the usual quality. In drawing pure iron wire a reduction of area of more than 98 per cent is obtained without annealing. It is found that the ability to work pure iron without annealing constitutes a great saving in cost as compared with the cost of working ordinary steel.

Because of its great ductility and its unusual cold-working properties, pure iron is particularly suitable for deep stamping, cold rolling and drawing. Another big field is that of pure iron boiler and other thin tubes, which, by the use of revolving cylindrical mandrels can be made as a finished product in the electrolytic cells. It is expected that the alloy steel field will furnish a considerable outlet for electrolytic iron, since its use assures purity of the ferrous content. The magnetic, resistance and tensile qualities of pure iron have attracted the attention of large manufacturers of telephones, cables and electrical apparatus.

Calculations of the cost of producing iron by the Eustis process are modified by allowances for the market value of by-products. Pyrite was the chief source of the world's sulphur until the development of the Louisiana deposits made it a losing proposition to obtain sulphur from pyrite. By the new process, however, the sulphur content of the ore assumes such importance that the sulphur obtained practically pays for the ore. On the average, a ton of sulphur is produced for each ton of iron. Deducting the value of the sulphur, the Milford company estimates that the cost of producing electrolytic iron will range from $50 to $60 a net ton of finished

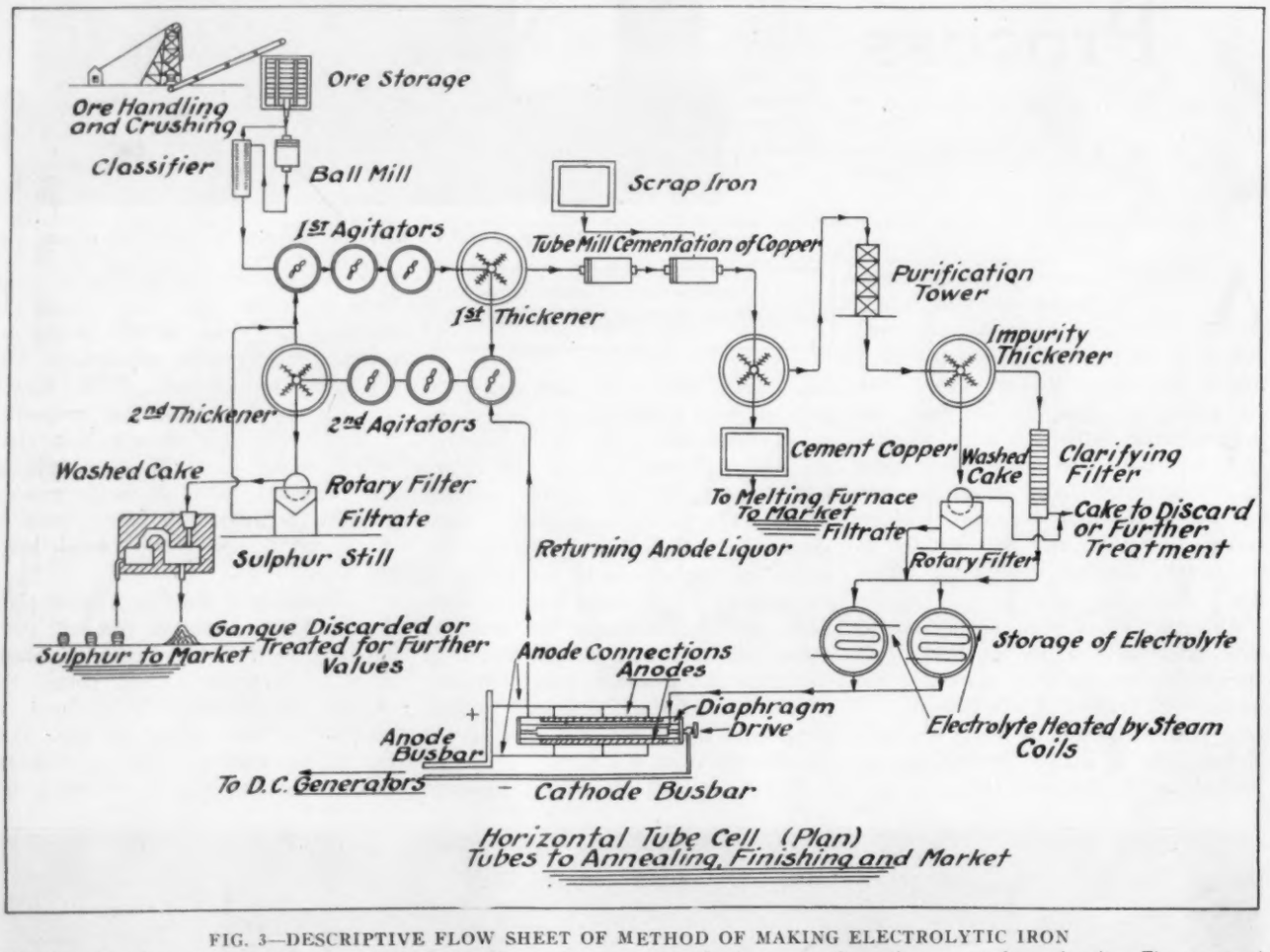


FIG. 3—DESCRIPTIVE FLOW SHEET OF METHOD OF MAKING ELECTROLYTIC IRON

This flow sheet is purely descriptive, no attempt having been made to preserve the true proportions, sizes or numbers of units. The process is here applied to a pyrrhotite ore or concentrate bearing copper

tubes or sheets under ordinary conditions, and that where the conditions are ideal, the cost will be less. These cost figures are subject to further reduction where the ore bears reclaimable copper, gold, silver and other elements.

Ferrous chloride is the electrolyte in the Eustis process. The first unit in the leach house shown in Fig. 2, is an agitator in which ore, ground to a fineness of about 200 mesh, meets ferric chloride and is dissolved, the solution thus being reduced to ferrous chloride. The overflow from the agitator goes to a settling tank or thickener which has two products, a clean overflow and a bottom sludge. The overflow from the settling tank goes to a cementation tank filled with scrap iron on which the copper contained in the solution is precipitated, as shown in the flow sheet, Fig. 3. The solution then flows to the storage tank which feeds the electrolytic cells. In the cells iron is deposited, the overflow from the cells being ferric chloride. The latter is fed to a second thickener where it meets the sludge from the thickener and dissolves out of the sludge the remaining iron, thus producing a clean tailing product. From the second agitator, the solution flows to a second settling tank and thence to the first agitator where it again is fully converted into ferrous chloride. The tailings are removed from the second thickener and the sulphur recovered from them by distillation.

For testing the various ores, the plant is provided with three small cells which are in constant operation. They have graphite plates as anodes while the cathodes are steel mandrels with a smooth machined surface. These cells produce iron tubes 4 inches in diameter and 1 foot long. The tubes are removed from the mandrel by rolling so as to increase their diameter slightly, after which they easily may be slipped off the mandrel. Large cells have been built which have capacity for producing tubes 12½ inches in diameter and 12 feet long. They are of substantially the same construction as the small cells.

FIG. 4—TEST CELL IN WHICH IRON FROM FERROUS CHLORIDE IS DEPOSITED ELECTROLYTICALLY IN FORM OF 4 X 12-INCH TUBES ON A REVOLVING MANDREL

A considerable tonnage also has been produced in the form of plates and construction of two improved plate cells just has been completed. Each cell has about 80 square feet of cathode surface, the output for each being 20 plates, each 2 feet square. In the tube cells, the mandrels are rotated by means of belts which engage a pulley on the outside of the cells, thus insuring a smooth deposit.

In the leach house as well as in the cell department the construction largely is of wood. This material was selected because it may be worked easily in order to meet changing needs of design. It has been ascertained, however, that the best material for a permanent commercial plant is concrete soaked in sulphur by the method developed by the Texas-Gulf Sulphur Co., and one tank of this material already has been constructed and has given entirely successful results. In all of the cells the anode and cathode compartments are separated by asbestos sheets through which the electrolyte seeps slowly from the cathode into the anode compartment. In order to maintain proper circulation, the flow is so controlled as to maintain the solution at a higher level in the cathode than in the anode compartment.

For handling pyrite ore, the plant is equipped with a gas-fired furnace. This is equipped with an electric thermometer and the ore is brought to a temperature of about 900 degrees Fahr. in order to drive off the excess sulphur. The sulphur is given off as a gas which is converted into liquid form in a condenser. The pyrite thus is changed to ferrous sulphide which is ready to be charged into the first agitator in the leach house. The remaining sulphur, as previously stated, is reclaimed from the tailings obtained from the second agitator.

A hot solution gives best results both in dissolving the ore and depositing the iron in the electrolytic cells. Inasmuch as the reaction by which ferric chloride becomes ferrous chloride is exothermic, generating 700 British thermal units per pound of iron and further heat is developed in the electrolyte, this condition is easily obtained. To have a hot electrolyte, therefore, it simply is necessary to converse the heat generated in the agitators and cells. The large tubes produced at Milford may be drawn into the finished product and, in drawing, the range of sizes is without limit owing to the extreme ductility of pure iron. The large tubes also may be cut into sheets or strips for cold rolling. Any of the products may be melted in the electric furnace and cast

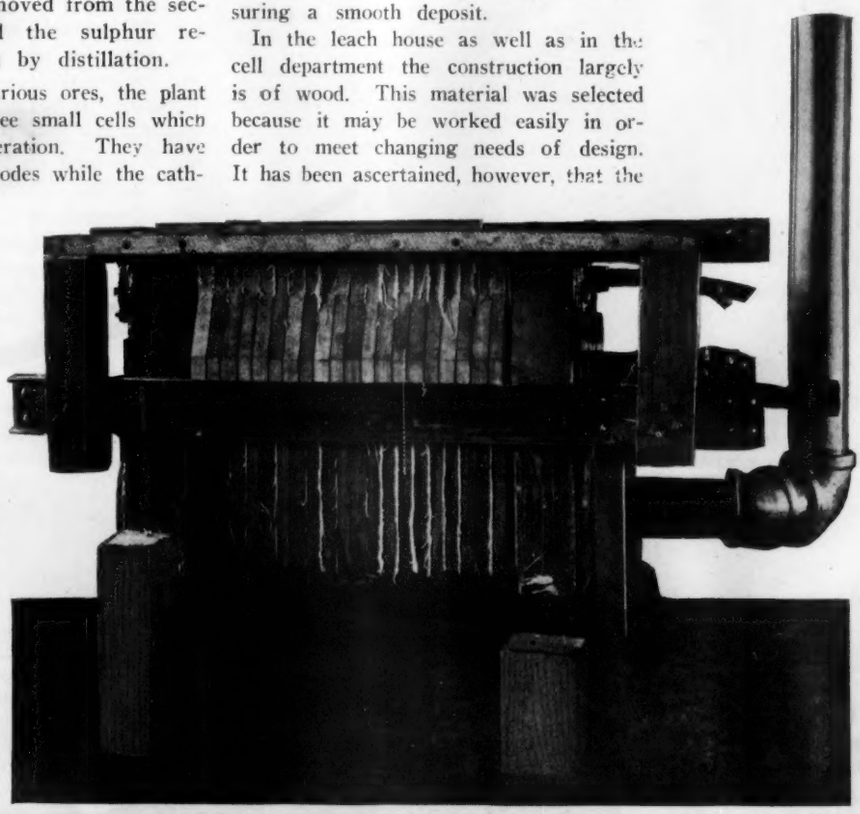


FIG. 5—CELL IN WHICH TWENTY 2 X 2-FOOT PLATES ARE PRODUCED SIMULTANEOUSLY. THE MATERIAL OF CONSTRUCTION IS WOOD, AND ASBESTOS SHEETS SEPARATE THE ANODE FROM THE CATHODE COMPARTMENTS

into billets; due to the fact that iron which has not been deposited uniformly or perfectly may be melted, there is practically no occasion for any scrap loss.

Consumption of current is about one ampere hour per gram of iron deposited. The speed of deposition may be controlled at will and is determined by the relation of the cost of the power to the capital charges and also, within limits, by the quality of surface desired. For instance the plate cells may be operated with 2000 to 4000 amperes. By the slower current, an output of 20 plates, each 2 x 2 feet and ⅛ inch thick is obtained in 96 hours, and the surfaces of the plates are relatively smooth. Also, with the slower current less power is consumed. With 4000 amperes the same output is obtained in 48 hours but the surfaces of the plates are less smooth. A larger plant, entailing a larger investment, is necessary when using the slower current so that the speed of driving the cells is a matter that must be determined carefully. Generally speaking, it is desirable to distribute the overhead cost over as large a tonnage output as is feasible.

Considerable investment is required to produce electrolytic iron, although the plant probably is not more expensive from a tonnage standpoint than the equipment it tends to replace, namely, the blast furnace, open-hearth furnace and rolling mill. The company is not yet certain about capital charges but believes they will range from $10 to $20 per ton of iron.

Application of the Eustis process necessarily is dependent upon the availability of cheap electric power. The company regards $20 to $30 per horsepower a year as cheap power, and anything up to $35 is not prohibitive. At $20 per year, the cost for power per ton of iron, provided the plant operates 90 per cent of the time, would be $4.90 when working at a rate that gives two volts resistance. Current efficiency in the new process is high. It always is above 85 per cent but averages closer to 95 per cent and on occasions has been 97 per cent of the theoretical performance per ampere.

Owing to the abundance of sulphide ores, the field for the process appears world-wide. Scattered all over the earth's crust are deposits of such ores. They formerly constituted the basis for the manufacture of sulphur and sulphuric acid but today there is no broad commercial use for them. They are unsuitable for use in blast furnaces without being roasted to get rid of the surplus sulphur. Too, a blast furnace with capacity under 500 tons per day is not generally considered, whereas many deposits of ore do not lend themselves to production at a large enough rate to supply such a plant. Even small deposits come within the scope of the electrolytic process, as this process is applicable to quantities as low as 10 tons per day, provided the recovery of the by-products reaches any substantial proportions.

Another important feature of the electrolytic process is that it will permit the creation of self-contained, complete industries in countries and sections where the materials which are necessary for the production of steel by the blast furnace method, do not occur in juxtaposition. Italy, for instance, has large quantities of pyrite and is rich in water power. That country has no oxide ores and no coke. The use of the electrolytic process, therefore, is expected to enable Italy to develop a self-contained industry. It also is expected that the new process will enable many sections of the United States where non-producing iron ore deposits occur, to join the ranks of the iron makers.

Mystic Iron Works, Everett, Mass., which was incorporated in July with $100,000 capital, has petitioned the city and state for the necessary permits for the construction and operation of blast furnaces. It is planned to produce pig iron for the New England market. There are at present no blast furnaces for pig iron in New England. The proposition will ultimately involve an investment of between $3,000,000 and $4,000,000, according to the officials of the Everett company.

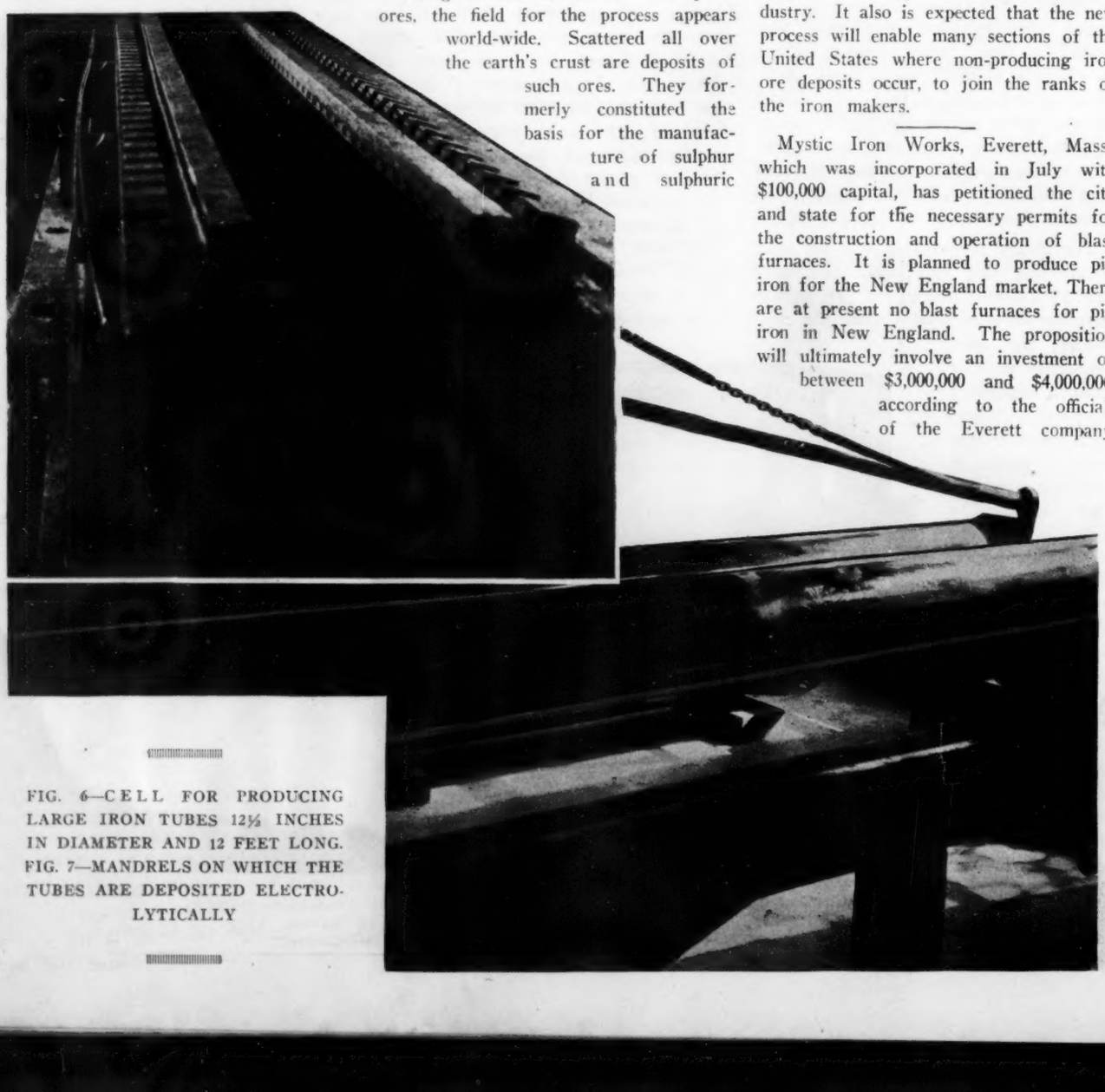


FIG. 6—CELL FOR PRODUCING LARGE IRON TUBES 12½ INCHES IN DIAMETER AND 12 FEET LONG. FIG. 7—MANDRELS ON WHICH THE TUBES ARE DEPOSITED ELECTROLYTICALLY

Using Fuel Oil in Air Furnaces

Proper Combustion, Close Control of Heat, Attention to the Charge and Regulation of the Time Element Are Factors in Operation of Oil Fired Malleable Iron Melting Units

BY A. V. LANDSCHOOT

USE of fuel oil in the air furnace has, to a certain extent, been looked upon with disfavor, mainly because of faulty application and lack of reliable data to prove the merits of fuel. The statements made here are not intended to prove the superiority of the use of fuel oil in the melting process, nor should they be taken in criticism of any other fuel in general use in the malleable castings industry today. Powdered coal, electricity and the usual hand-firing methods, all have their place and because of geographical situation, local conditions, investments involved, character of work, etc., each could easily have greater advantage over any of the other methods known to modern practice. All statements are based upon the writer's several years of melting and laboratory experience while in the employ of one malleable foundry and all data submitted is in accordance with actual conditions existing and the practice followed in the operation of this plant, regardless of the theories or methods in use in the industry as a whole.

Furnace Repair and Fuel Data

	Total for period	Per Ton
Repair, including hauling brick and material, building bungs, etc.	1,030 hours	32 minutes
Roof repairs:		
13-inch bungs	34	
13-inch bung brick	1,054	
18-inch bungs	54	
9-inch bung brick (straight and arch)	3,890	
Bung brick (9-inch equivalent)		3.0 brick
Sidewalls, including combustion chamber, hearth, neck and bridgewalls.		
9-inch straight brick	5,790	
9-inch wedge brick	250	
9-inch arch brick	370	
Soaps	330	
Splits	540	
Sidewall brick per ton		3.8 brick
Tapping blocks	44	
Bales of straw	22	
Fireclay	39,200 pounds	20.0 pounds
Silica sand	51,700 pounds	26.7 pounds
Fuel oil	119,800 gallons	61.9 gallons

To obtain the best results, construction of the oil-fired furnace should not only be as simple as possible but all essentials must be in harmony with each other and favor the all important objects; correct furnace atmosphere, proper velocity of the gases and the best possible heat absorption by the scattered charge. High air and atomizing pressures, as well as excessive draft, which necessitate radical baffling at the rear bridge wall, should in cases wherever practicable, be avoided.

The melting furnace with details shown in Figs. 1 and 2 is typical of simple construction. To give the combustion chamber the desired length a short extension was built on brackets fastened to the end plate of the original firebox. The bung line has a gradual slope from its highest elevation to a point midway between the front bridge wall and tapping hole; this arrangement promotes a better mixture of the secondary air with the first product of combustion; furthermore, it causes the heat to be deflected upon the charge. The roof above the hearth of the furnace is practically level and no higher than necessary to accommodate a slight excess of the usual charge. A gentle curve beginning at the back charging bung corresponds to the size of the wall opening and favors a desired deflection of the leaner flame upon the extreme portion of the charge.

The size of the bridge wall opening is largely determined by the action of the furnace gases. Any back pressure through the skimmer door, however slight, is avoided by a corresponding increase of opening. The stack being only 50 feet high and 3 feet in diameter necessitates a large bridge wall opening; this feature, however, is desirable as it promotes a uniform speed of the moving gases over the entire charge and tends to prevent excessive heat radiation through bungs and sidewalls. The larger bridge wall opening, in preference to a high stack, also favors a more uniform temperature throughout the furnace, as indicated by the melting effect on the back portion of the charge. The apparent waste of heat in the neck of the furnace is curbed in an effective manner by the function of the checkwork opposite the outlet of the furnace into the stack.

Only one high pressure burner is used for firing purposes. This burner is of the simple, fan tail, external mixing type and has been in constant use for years. The oblong fuel and atomizer openings are independent of each other and there is no possibility of clogging or carbon deposition at the orifices. The oil as it passes out perpendicularly under suitable pressure is struck forcibly at a right angle by the steam used for the atomizer and a broad, fan shaped flame, corresponding to the shape of the combustion chamber, is produced. Air, at fairly low pressure, is admitted through a 14-inch pipe below the burner, in quantities barely sufficient to produce the first product of combustion. Even a tendency toward carbonization against the combustion chamber roof or a noticeable backfiring toward the burner is tolerated without concern. A steam pressure of 20 to 30 pounds is sufficient to atomize the fuel and give the proper velocity to the burning mixture.

The oil is pumped from large storage tanks through a twin strainer into a small preheating tank provided with an air cushion. The pulsation effect, caused by the strokes of the pump, is thus eliminated and a constant and steady pressure at the burner insured. The oil and steam supply pipes leading to the burner are incased side by side in one insulating cover. A temperature of about 130 degrees Fahr., as indicated by the thermometer on the oil line near the burner, seems sufficient to reduce the viscosity of the oil to a free flowing point.

The question of burner superiority is

From a paper presented at the Cleveland convention of the American Foundrymen's association, April 28-May 3. The author is connected with the Iowa Malleable Iron Co., Fairfield, Iowa.

not as important as in most oil burning systems. It is a minor factor and double stage burning is the answer. The most desirable features include one burner only; simple, rigid construction and freedom from clogging, regardless of design; ease of manipulation and adjustment to conform to the shape of the most suitable combustion chamber, and very important—the ability to atomize fuel of any specific gravity or grade offered on open markets.

In determining the size of the combustion chamber a number of points must be given due consideration. Its length is dependent upon the type of burner, as well as the pressure of the atomizing agent and the blast. A length of 9 to 10 feet seems to give the best results in connection with the external mixer burner now in use. The width and height are proportioned to the size of the furnace. The mouth of the present combustion chamber is 18 inches narrower than the furnace proper. This arrangement is preferred over full width as it affords ample protection to the side walls and promotes a more uniform mixture of the top blast and the monoxide gases.

The top blast is the important pivot upon which the main essentials of successful operation are balanced. This statement cannot be emphasized too strongly as fuel consumption and time, oxidation and repairs are powerfully influenced by the application of the secondary air supply. Excessive oxidation of the elements proved the recognized stumbling block in the early stage of oil melting practice, yet an attempt to remove the source of evil, that is, excess air forced in contact with the charge by elimination of the top air as a whole or in part, lacked effect and proved a waste of fuel and time through failure of the liberated heat to yield its maximum intensity. It should be kept in mind, with oil as fuel, that the incorrect proportioning of the top and bottom blast, necessitated by intermittent hand-firing conditions no longer exists and since oil lends itself to a constant and most favorable fuel distribution the logical solution is first to eliminate excess air, and then utilize the great advantage of double stage burning to the fullest extent. The usual 70-30 air ratio therefore is changed as soon as the furnace temperature permits to a 50-50 ratio and in order to minimize the effect of this radical change on oxidation the volume of air is reduced to approximately theoretical amounts. It is a matter of choice between two evils, too much or not enough air, and actual results rather than the generally accepted rule should determine the preference.

The most complex problem in connection with a balanced air ratio is the difficulty in bringing about a homogeneous mixture of the advancing combustible gases with a theoretical amount of overhead blast. It is of the utmost importance, therefore, that the top blast be delivered in such a way that the best possible contact of fuel and air results. The desired effect can only be brought about by admitting the overhead blast under fairly low pressure through a suitable number of large bung openings. With these openings across the entire width of the combustion chamber and not over 4 inches apart, the effect of the secondary air extending in every direction should be continuous and obviously but a small amount of the gases can escape final combustion. The exact location of the blow bung, the correct angle and size of the blast pipes, as well as the proper air pressure, are important features and must be determined by repeated experiments. If the air pressure is too weak the blast will not penetrate the gases sufficiently to surround every particle of unconsumed fuel and a low temperature results where intense heat is actually needed.

In determining the pressure some consideration must be given to the secondary function of the top blast, which in addition to supplying the necessary oxygen, serves as a deflector of the burning gases upon the charge. This impingement is considered a necessary detail of successful operation in that it favors rapid and efficient heat transfer to the metal throughout the melting process and tends to break up the continuity of the heat flow to the extent that better radiation from the brickwork beyond follows. With too high pressure, however, there is danger of blowing holes through the fire and consequently increased portions of unconsumed oxygen forced in contact with the melting charge favor undue oxidation of the elements. Fortunately a certain amount of oxidation is desirable and with a properly designed top blast arrangement and its dual function in mind the elimination of the desirable portion of the elements becomes a simple, predetermined matter. A slight turn of the oil valve or a mere change of the lever controlling the overhead blast openings does the trick.

Among the outstanding advantages of

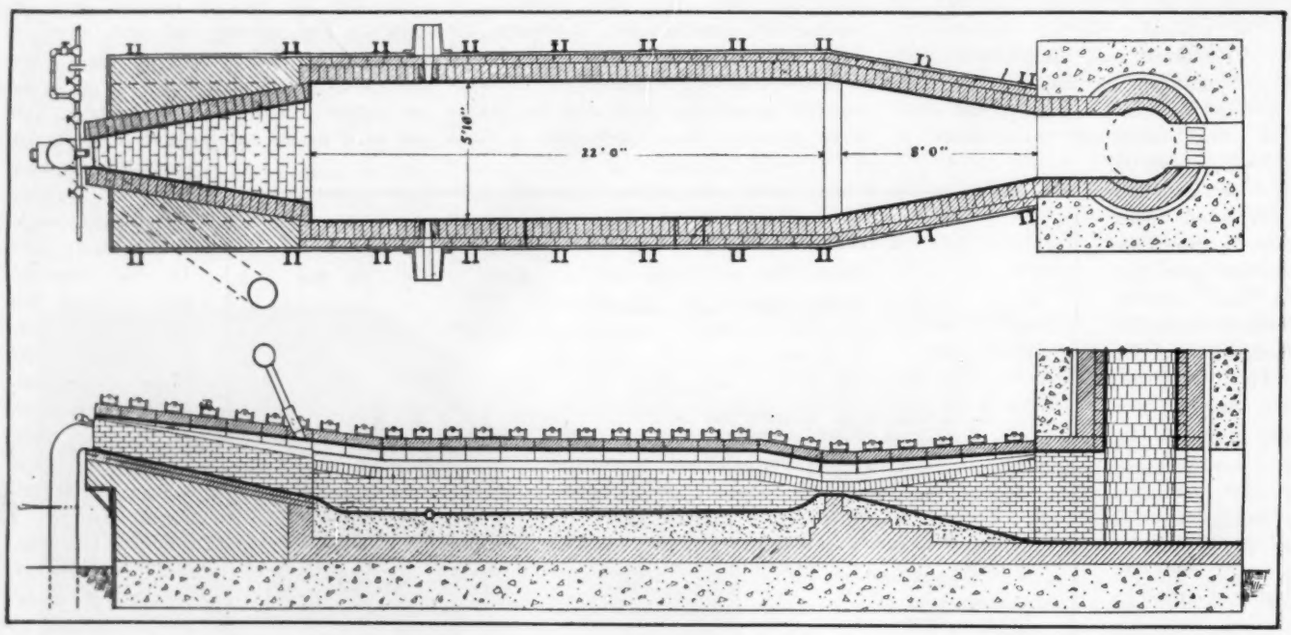


FIG. 1—PLAN AND SECTIONAL VIEW OF A 13-TON OIL FIRED AIR FURNACE FOR PRODUCING MALLEABLE IRON

oil firing are the uniformity of operation and the ability to produce the desired composition as soon as the iron has attained the proper pouring temperature. The accompanying table shows the record of twenty consecutive heats run without changing the initial charge or the method of firing in any way. This data illustrates the possibilities of oil firing, as well as the uniformity of the product. The oil consumption is somewhat high, due to small heats, nevertheless these figures offer a saving for this locality of at least 20 per cent over the fuel cost of hand firing. The best oil and melting rates, as well as the most uniform results, are obtained from two small heats, especially from the standpoint of molders daily production. Actual trials indicate that large heats offer no economy as far as fuel consumption and other melting cost, including furnace operating and repair labor and refractory materials are concerned. Increased production and decreased foundry space reduce fixed charges and overhead expense beyond any possible increase of indirect foundry labor costs.

In operating on a two heat schedule, the 9-hour day is divided by the noon hour into two separate and complete periods of 4½ hours each. Of each period nearly 4 hours are devoted to molding; the remaining half hour to pouring, dumping and the removal of castings from the sand. Owing to efficient furnace control this schedule now is followed with almost clockwork precision. All overtime is eliminated, with the exception of sand cutting, and the necessary furnace repairs at each week end.

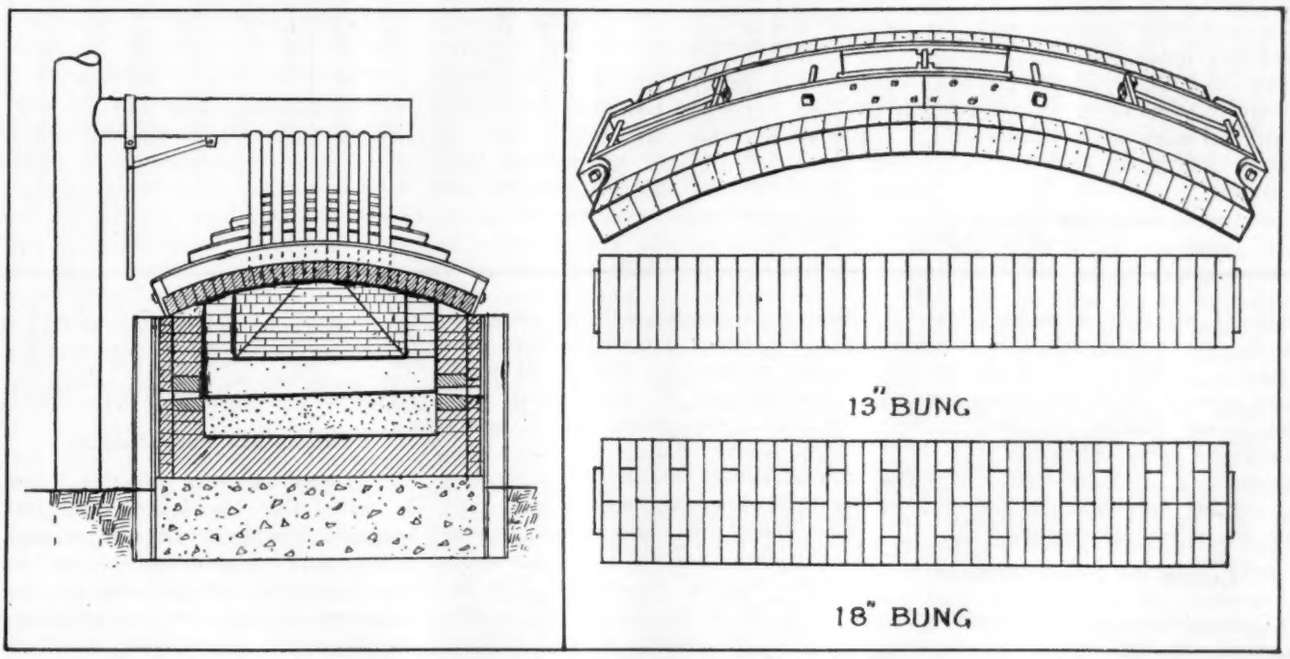


FIG. 2 (LEFT)—CROSS SECTIONAL VIEW OF A 13-TON OIL-FIRED MALLEABLE FURNACE. FIG. 3 (RIGHT)—SKETCH SHOWING CONSTRUCTION OF FURNACE BUNGS, FRAMES AND SETTING OF BRICK FOR 13-INCH AND 18-INCH BUNGS

heats approaching the normal capacity of the furnace. If the furnace is taxed beyond capacity the oil consumption raises again, a condition resulting from the abnormal increase of time required to superheat the charge, as well as the necessity to maintain a high roof over the hearth in order to accommodate the bulky charge. A rather long, narrow hearth is desirable for quick results. This construction favors heat absorption by the charge and if the top blast is properly reduced during pouring time, the molten metal need not be endangered from excess oxidation as the result of a shallow bath. Providing the initial charge, however small, is properly distributed, prompt melting and skimming, quick superheating and a corresponding decrease of pouring time will readily offset the higher oxidation rate afforded by a shallow bath.

The question of one large or two small heats per day received every consideration and has resulted in favor of

Loss and Gain of Elements

In considering the behavior of the elements during melting, little attention need be paid to the sulphur content of the charge. The increase is invariably small and seldom in excess of 10 per cent of the original content. Unless off-sulphur pig iron is used intentionally the hard iron always analyzes below 0.05 per cent sulphur.

Phosphorus is controlled easily; its gain is in proportion to the melting loss and a fairly constant figure is readily obtained through suitable pig iron selection. As a safeguard against annealing troubles, this element is seldom allowed to run above 0.18 per cent. The extra margin of fluidity that a higher phosphorus content might impart to the molten metal is too insignificant to jeopardize the product to an extent that cannot be predetermined.

The oxidation of silicon and manganese goes hand in hand and takes place mostly while the charge is melting. The nature and amount of slag indicates whether the elimination of these elements has been moderate or excessive. With comparatively low losses corresponding to the figures submitted in the accompanying table the slag proves viscous and amounts to about 135 pounds per ton of metal charged. With higher silicon and manganese losses the slag appears more fluid and increases in weight at the approximate rate of 10 pounds per ton for every 10 points additional silicon loss. This condition, however, is somewhat influenced by the carbon loss, which has an indirect, yet noticeable effect upon the erosion of the sidewalls below the metal line and consequently upon the basicity and bulk of the slag. The extent of the silicon and manganese loss depends mainly upon the excess of total or top air, the position of the wind bung, efficient distribution of the charge and its initial content. Excessive oxidation of these elements, as a direct result of the bessemerizing effect of too high top air pressure, is not desirable, in spite of the attractive oil rates obtained.

The amount of silicon and manganese eliminated in this practice depends upon the composition of the pig iron in the stock, as well as the supply of available sprue. The total remelt seldom runs in excess of 40 per cent of the charge in

Record of Twenty Consecutive Heats Run from Oil Fired Furnace

Tests Made Without Changing or Adjusting Charge and Method of Firing. Contents of Charge, 50 Per Cent Pig Iron, 40 Per Cent Sprue, and 10 Per Cent Malleable Scrap

								Analysis of Charge					Analysis of Hard Iron					Loss and Gain of the Elements				
Date	Heat No.	Weight of charge Lbs.	Gals. oil used	Gals. per ton	Fire started	Heat Tapped	Time Per Heat Hrs.	Min.	Sil. Per cent	Sul. Per cent	Phos. Per cent	Man. Per cent	Total Carbon per cent	Sil. Per cent	Sul. Per cent	Phos. Per cent	Man. Per cent	Total Carbon per cent	Sil. loss	Sul. gain	Phos. gain	Man. loss	Tot. Carbon Per cent
11/14	A. M.	290	17000	530	62.5	8:20	11:20	3	0	1.27	.042	.160	.38	3.01	.92	.044	.164	.28	2.51	.35	.002	.004	.10	.50
11/14	P. M.	292	17000	530	62.3	2:20	5:05	2	45	1.29	.042	.159	.37	2.98	.92	.043	.166	.27	2.38	.37	.001	.005	.10	.60
11/15	A. M.	294	17000	540	63.5	8:20	11:20	3	0	1.28	.041	.163	.38	3.02	.96	.046	.163	.26	2.54	.32	.005	.000	.12	.48
11/15	P. M.	296	17000	500	58.8	2:15	5:00	2	45	1.28	.041	.164	.37	2.97	.91	.047	.167	.27	2.58	.37	.006	.003	.10	.39
11/16	A. M.	298	17500	560	64.0	8:15	11:20	3	5	1.30	.042	.162	.37	3.04	.95	.045	.165	.26	2.49	.35	.003	.003	.11	.55
11/16	P. M.	300	16500	530	64.2	2:10	5:00	2	50	1.28	.043	.164	.37	3.06	.94	.047	.173	.24	2.46	.34	.004	.009	.13	.60
11/17	A. M.	302	17000	560	65.9	8:20	11:25	3	5	1.30	.042	.164	.37	3.02	.96	.046	.171	.26	2.48	.34	.004	.009	.11	.54
11/17	P. M.	304	17000	510	60.0	2:15	5:00	2	45	1.29	.043	.167	.36	3.00	.94	.044	.174	.25	2.41	.35	.001	.007	.11	.59
11/18	A. M.	306	15500	520	67.1	8:15	11:20	3	5	1.30	.042	.166	.37	3.01	.88	.043	.168	.24	2.34	.42	.001	.002	.13	.67
11/20	A. M.	308	17500	580	66.3	8:20	11:20	3	0	1.29	.041	.164	.36	2.99	.106	.045	.169	.27	2.11	.23	.004	.001	.09	.85
11/20	P. M.	310	17000	540	63.5	2:20	5:05	2	45	1.25	.041	.164	.36	2.96	.98	.047	.159	.25	2.37	.27	.006	.005	.11	.59
11/21	A. M.	312	17000	560	65.9	8:20	11:20	3	0	1.32	.042	.165	.37	2.88	.101	.047	.169	.26	2.46	.31	.005	.004	.11	.42
11/21	P. M.	314	17000	530	62.3	2:20	5:00	2	40	1.30	.042	.161	.36	2.97	.99	.047	.170	.25	2.41	.31	.004	.009	.11	.56
11/22	A. M.	316	17000	560	64.0	8:25	11:25	3	0	1.31	.043	.165	.37	3.00	.101	.043	.171	.27	2.42	.30	.000	.006	.10	.58
11/22	P. M.	318	15000	500	66.6	2:25	5:00	2	35	1.30	.043	.166	.36	2.99	.102	.049	.167	.26	2.58	.28	.006	.001	.10	.41
11/23	A. M.	320	16500	540	65.5	8:20	11:25	3	5	1.31	.041	.166	.37	2.99	.98	.046	.164	.26	2.44	.33	.005	.002	.11	.55
11/23	P. M.	322	16000	480	60.0	2:20	5:00	2	40	1.31	.044	.164	.37	3.05	.98	.044	.167	.25	2.50	.33	.000	.003	.12	.55
11/24	A. M.	324	17000	550	64.7	8:20	11:20	3	0	1.30	.042	.163	.37	3.00	.98	.045	.164	.26	2.39	.32	.003	.001	.11	.61
11/24	P. M.	326	16500	490	59.3	2:20	5:00	2	40	1.30	.042	.164	.36	3.02	.97	.048	.162	.26	2.56	.33	.006	.002	.10	.46
11/25	A. M.	328	17000	530	62.3	8:20	11:20	3	0	1.30	.043	.163	.37	2.98	.95	.049	.165	.26	2.53	.35	.006	.002	.11	.45
Average			16750	532	63.5	A. M. P. M.		3 2	1.29	.042	.164	.37	3.00	.96	.046	.167	.26	2.45	.33	.004	.003	.11	.55

Pouring Time—Morning heats 11:25 to 11:55 A. M.
Afternoon heats 5:00 to 5:30 P. M.

spite of the light to medium class of work. No attempt has been made to establish oxidation rates below the figures given in the accompanying table as this would lead to abnormal sulphur-manganese ratios unless the usual sprue shortage is offset by high sulphur-low silicon and manganese pig iron or large amount of malleable scrap.

Carbon the Unruly Element

Carbon is the most unruly element to contend with and has proven the main source of grief during the experimental stage of oil firing. Malleable scrap or steel of uniform composition is used to reduce the initial carbon content of the charge. When no reliable scrap or no low manganese or high sulphur pig iron is available, the preference goes to steel in conjunction with an intentionally high oxidation rate. The idea is to normalize the sulphur-manganese ratio through elimination of the excess manganese ratio through elimination of the excess manganese. The higher metal cost thus created is partially or wholly offset by a better fuel rate, incidentally followed by faster melting.

The elimination of silicon is not necessarily associated with a proportionate carbon loss. Under certain conditions either element may yield readily while the other holds tenaciously. During the first heat following the complete renewal of the furnace bottom, for instance, the carbon usually lowers abnormally, whereas the silicon and manganese persist. This tendency accounts for the higher silicon-lower carbon content of heat number 308 shown in the table. On the other hand, heats charged with the usual silicon and carbon percentages have been known to loose as high as 80 points silicon and only 35 points carbon. Similar cases, encountered during experiments, indicate that, if the silicon content is initially low to the extent that an under-balanced carbon-silicon ratio must follow, the latter element proves weaker than usual and yields abnormally, thereby favoring the carbon. The extent of the carbon loss usually is indicated by the granular to flaky structure of the final test plug, also by the color and behavior of the molten metal, the appearance of the slag and behavior of the molten metal, the appearance of the slag and other symptoms.

The most prolific source of carbon troubles is too high top air pressure. Other troubles are complex due to the influences of numerous factors. Undue carbon elimination may result from excess air, as well as prolonged firing, brought about by poor furnace control or a desire to run abnormally large heats, requiring prolonged exposure while superheating the molten metal previous to pouring. The following data gives a fair idea as to the protection afforded by a reduced atmosphere maintained over the bath during pouring; the volume of air admitted at this time, even though far below theoretical requirements, being sufficient to maintain a uniform metal temperature.

Heat No.	First Metal Poured Silicon per cent	First Metal Poured Carbon per cent	Last Metal Poured Silicon per cent	Last Metal Poured Carbon per cent
372	0.96	2.39	0.96	2.36
374	0.93	2.48	0.91	2.45
376	0.91	2.39	0.93	2.32
378	0.92	2.56	0.88	2.47
380	0.86	2.52	0.87	2.46
382	0.95	2.49	0.97	2.46
384	0.96	2.46	0.94	2.42
386	0.99	2.60	0.98	2.45

In case of heat No. 386 the top blast was not reduced until the heat was half tapped.

Results Are Predetermined

In connection with oxidation it can be stated that the desired hard iron analysis usually is attained through predetermined elimination of the excess impurities and that the physical properties are not affected noticeably by the extent of oxidation, as illustrated by the following results:

Sample Marked	Ultimate strength, pounds per square inch	Elongation in 2 inches, per cent
11- 1-252-2	57,520	25.50
11- 2-257-1	56,550	28.00
11- 3-261-1	55,860	27.00
11- 4-264-2	56,140	27.00
11- 6-268-2	56,610	22.00
11- 7-271-1	56,900	18.00
11- 8-277-1	54,910	22.50
11- 9-281-1	54,220	23.00
11-10-284-2	54,470	17.00
11-13-288-2	54,505	19.50
11-14-292-2	54,990	22.50
11-15-297-1	53,690	27.50
11-16-300-2	56,242	22.50
11-17-304-2	55,740	23.50
11-18-307-1	53,822	21.50
11-20-310-2	56,240	23.50
11-21-313-1	55,780	27.00
11-22-316-2	54,550	21.50
11-23-321-1	57,010	27.00
11-24-325-1	55,150	27.00
11-25-329-1	52,030	16.50
11-27-330-2	55,810	26.50
11-28-335-1	53,850	21.50
11-29-340-2	55,330	25.00
Total average	55,330	23.40

Average of No. 2 furnace bars (samples marked 2). Ultimate strength, 55,679 pounds. Elongation in 2 inches, 22.92 per cent.

Average of No. 1 furnace bars (samples marked1). Ultimate strength, 54,981 pounds. Elongation in 2 inches, 23.87 per cent.

This monthly report gives the tensile properties of an equal number

of daily tests obtained from two oil-fired furnaces operated in a different manner. The chemical data on some of these tests is shown in the accompanying table under corresponding dates and numbers. The final composition runs uniform for both furnaces, although the silicon loss averaged 56 points for the bars obtained from No. 1 furnace, as against 33 points in the case of No. 2 furnace. No. 1 furnace was charged with 54 per cent pig iron, 6 per cent steel and 40 per cent sprue; while No. 2 contained 50 per cent pig iron, 10 per cent malleable scrap and 40 per cent sprue. The favorable comparison of the average results proves that, irrespective of the initial charge, the manner of operation can be adjusted to bring about ultimate uniformity.

One of the important factors worthy of consideration in studying the operation of the air furnace is the serviceability of firebrick used for sidewall replacement and bung construction. The saving of refractory material is a recognized feature in favor of oil firing and its importance can be further emphasized by giving due consideration to the correspondingly substantial decrease of repair labor. Actual results covering a five months' run are shown in an accompanying table. The tests covered 228 heats, averaging 8.5 tons, the total melt being 1938 tons.

The combustion chamber, including the bungs covering same, seldom requires attention during repair time, in fact the life of this part of the furnace, with the exception of the extreme ends of the combustion chamber and the bottom directly below the blow bung, exceeds one year of continued service. While the furnace is repaired weekly, the 9-inch inner lining of the angle walls, or that portion of the sidewalls extending from the end of the combustion chamber towards the middle of the hearth for a length of about 10 feet, serves a three weeks' run of two daily heats. The remaining stretch of the sidewalls up to the rear bridge wall is batted wherever needed, during repair time; the bats recovered from the angle walls and the crushed salvage of the bungs used for this purpose. By resorting to this manner of maintenance the original lining of this portion of the sidewalls serves a 7 to 10 weeks' run.

The bottom of the furnace is taken up once a week and renewed with fresh additions of washed silica sand. The brick bottom has been tried out during the course of experiments but its adoption was abandoned for various reasons. While the saving of labor and material is unquestionably in favor of the brick bottom, especially where large heats are the rule, it was found that these bottoms became ragged within a short time and the formation of pools of molten metal proved a source of additional fuel requirements.

The life of the bungs is perhaps the most interesting feature in connection with the function of refractory materials. Figs. 4 and 5 give the graphic and tabulated results as obtained from experiments with over 200 bungs on which individual records were kept. These service tests, covering a 2-year period were carried on under various furnace conditions and the brick used for the purpose included different brands obtained from five firebrick producers. While it is not intended to enter into a lengthy description of results, it might prove of interest to bring out a number of definite conclusions drawn therefrom.

A saving of not less than 15 per cent of the initial cost of the brick is brought about by substituting the undisturbed 13-inch bungs with 18-inch bungs. Taking for granted that the 18-inch bungs last fully as long as the 13-inch bungs and knowing that 43 13-inch bung brick have an area equal to the 72 9-inch straight and arch brick required to build one 18-inch bung, a simple multiplication of the number of brick used by their respective price will prove this statement.

In selecting brick for bung purposes the texture is carefully examined and the density and porosity, as well as the size of the particles and the degree of burn are observed closely and given primary consideration. A comparison of numerous fractures with available data on individual service tests points to an apparent relation between actual service, porosity and spalling action. This rule, however, is not always consistent and it is found, especially in case of the denser, finer grained brick, that lack of initial spalling resistance is not a sure indication of decreased serviceability. Extremely porous brick

2 SMALL HEATS PER DAY - AVE 8.5 TONS 76 BUNGS USED AVE LIFE 49 HEATS AVE LIFE 416 TONS					2 MEDIUM HEATS PER DAY - AVE 10.8 TONS 74 BUNGS USED AVE LIFE 41 HEATS AVE LIFE 444 TONS					ONE LARGE HEAT PER DAY - AVE 13.7 TONS 80 BUNGS USED AVE LIFE 31 HEATS AVE LIFE 428 TONS				
LOCATION	SIZE	TOTAL BUNGS USED	AVE LIFE OF BUNG IN HEATS	AVE LIFE OF BUNG IN TONS	LOCATION	SIZE	TOTAL BUNGS USED	AVE LIFE OF BUNG IN HEATS	AVE LIFE OF BUNG IN TONS	LOCATION	SIZE	TOTAL BUNGS USED	AVE LIFE OF BUNG IN HEATS	AVE LIFE OF BUNG IN TONS
A	13"	2	75	622	A	13"	3	50	570	A	13"	3	44	570
B	18"	4	55	488	B	18"	4	47	493	B	18"	5	36	495
C	18"	5	49	441	C	18"	4	41	444	C	18"	5	33	445
D	13"	8	32	280	D	13"	7	26	273	D	13"	7	21	291
E	18"	5	42	363	E	18"	4	32	346	E	18"	7	25	341
F	13"	8	35	303	F	13"	7	29	307	F	13"	8	20	272
G	18"	5	46	384	G	13"	3	43	434	G	18"	5	29	400
					GG	18"	4	44	479					
H	18"	5	47	406	H	13"	4	44	466	H	18"	4	40	565
I	18"	3	65	534	I	18"	4	53	573	I	18"	4	36	514
J	18"	3	63	534	J	13"	4	42	446	J	18"	4	40	534
K	18"	4	57	466	K	13"	5	36	379	K	18"	5	35	456
L	13"	6	39	330	L	13"	6	33	356	L	13"	7	21	288
M	18"	5	54	462	M	18"	4	40	421	M	18"	4	36	490
N	13"	5	46	390	N	13"	5	35	375	N	13"	4	24	343
O	18"	4	56	461	O	18"	3	57	607	O	18"	4	41	549
P	18"	3	69	601	P	18"	2	74	871	P	18"	3	46	667
Q	13"	1	131	1043	Q	13"	1	115	1219	Q	13"	1	116	1620

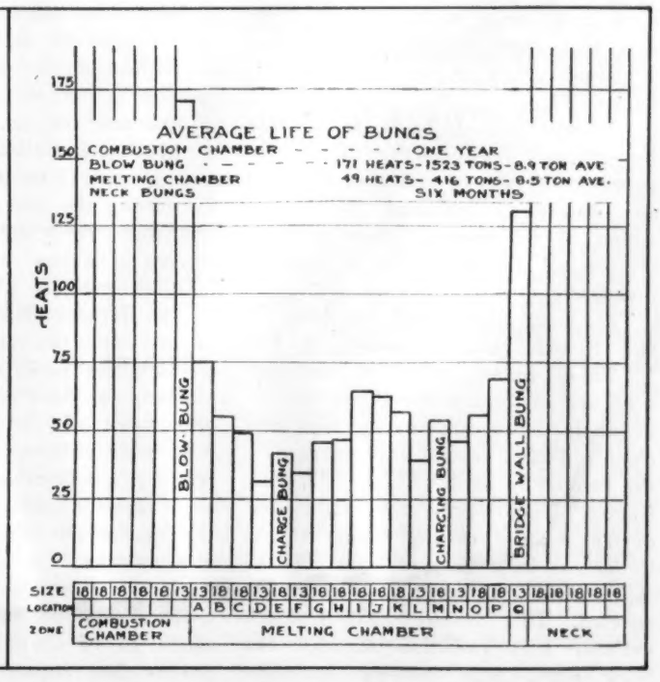

AVERAGE LIFE OF BUNGS
COMBUSTION CHAMBER - - - - - ONE YEAR
BLOW BUNG - - - - - - 171 HEATS-1523 TONS-8.9 TON AVE
MELTING CHAMBER 49 HEATS- 416 TONS- 8.5 TON AVE.
NECK BUNGS SIX MONTHS
HEATS
175
150
125
100
75
50
25
0
BLOW BUNG
CHARGE BUNG
CHARGING BUNG
BRIDGE WALL BUNG
SIZE 18 18 18 18 18 13 13 18 18 13 18 13 18 18 18 18 18 13 18 13 18 18 13 18 18 18 18
LOCATION A B C D E F G H I J K L M N O P Q
ZONE COMBUSTION CHAMBER MELTING CHAMBER NECK

FIG. 4 (LEFT)—DIAGRAM WHICH SHOWS THE LIFE OF FURNACE BUNGS. FIG. 5 (RIGHT)—CHART INDICATING LIFE OF BUNGS ON 13-TON OIL-FIRED AIR FURNACE

are not desired, as a rule they spall readily, lack strength and afford poor resistance to the abuse of frequent handling.

Selecting Brick for Bungs

Mechanical strength, brought about by increased density and hardness, is the essential sought in the 13-inch brick used for the bungs on each side of the charging openings. These bungs are severely abused through contact with the descending charge and the leveling rods and in their case mechanical strength overshadows the significance of other qualities. As for the 18-inch bungs, if the texture indicates that extreme density and excessive porosity have been avoided by blending various portions of small to medium grained calcined and flint material with just enough bond clay of sufficient coarseness to give uniform cohesion and providing the initial clays possess a suitable degree of refractoriness one is almost assured of excellent service. Such brick, in spite of apparent tendency towards density, are quite neutral to expansion and contraction; the resistance to spalling, notwithstanding the general opinion to the contrary, is much greater than in the coarse, open and porous brick.

The chemical composition of fire brick for bung purposes needs no comment; this feature, as well as the expansion and contraction, seems well taken care of by the firebrick producer. This statement is corroborated in Fig. 4, showing the life of numerous bungs. A comparison of the tonnage served in the small, medium and large heats fails to indicate that more frequent cooling has a marked effect on the service of the bungs.

A lower priced brick is suitable for sidewall replacements. The main requirements are of sufficient hardness and density to withstand the cutting action of the moving gases and the erosion of the metal in a uniform manner.

The bung frame used for both 13 and 18-inch bungs is shown in Fig. 3. These frames, made of malleable iron, are easily assembled and last indefinitely; they are strong and efficient and offer several advantages over the commonly used "T" and "I" bung frames. Undoubtedly the most important feature of the frame is that it leaves fully 85 per cent of the top surface of the brick work uncovered. This feature enables more uniform heat radiation through the brick work, thus insuring increased service of the bung. Another desirable point is that the bungs are readily stacked in tiers during repair time, without resultant damage to the brickwork.

In connection with the operation of the oil-fired furnace it can be stated that the importance of a great factor, human nature, often is disregarded. This condition exists in spite of abundant proof that the human factor has a tendency to curb the possibilities of an ideal fuel to the extent that uniformity and other essentials unnecessarily suffer. Costly experience, resulting from over-confidence, lack of knowledge or subsequent neglect, has proven in many instances that the principles of metallurgy, chemistry and combustion cannot be minimized in initial installation, nor disregarded in subsequent furnace adjustments necessitated from time to time by radical changes in the size of the heats or the contents of the charge.

Usually the furnace attendant is infused with a number of traditional ideas, inherited from hand-firing practice, and while these ideas obviously are detrimental when applied to a constant fuel, it is nevertheless no small task to convince the furnace man of the obsoleteness of his doctrine. Thus, the most prolific source of fuel waste and lack of uniformity is brought about by the general tendency to produce a flame that puffs through the bungs and cracks, and when in spite of discomfortable surroundings, as a result of excessive radiation and the side pressure through skimming doors, the furnace tender remains skeptical, until the metallurgist has demonstrated that a lean flame actually does the work and does it fast. Again the initiate may become so enthusiastically convinced that his previous assumption involved a waste of fuel and time and more important to him, a waste of physical energy; that he resorts to the other extremity by cutting the fuel supply to the extent that excess oxidation and unruly furnace conditions must follow.

In determining the proper density of the furnace flame, a faint outline of the opposite sidewall as viewed through the back skimming door or similarly a fixed impression of the appearance of the bung above the bridgewall as seen through the stack opening serves as a guide. However, since density does not denote effectiveness unless the flame has a suitable velocity; the all-important problem—maximum heat absorption by the charge—must be solved through consideration of the interdependent conditions that impart to the flame the velocity that yields the best obtainable thermal efficiency. The wide range of straight line to circular flow of the flame, important as it is, means little to the furnace man. Again, therefore, the human element may interfere during repair time, by making a thoughtless furnace change, apparently of minor importance, thereby changing velocity and thermal efficiency.

Lack of Uniformity Explained

It is a common belief that no two air furnaces of identical proportions can be made to operate alike, but in line with the foregoing and in view of the fact that most of the usual attention is centered on heat generation and comparatively little on heat absorption, is it after all a mystery? Does it not point to the complexity of delicate conditions existing within a crude melting apparatus?

In connection with the foregoing it can be stated that the use of fuel oil offers a logical solution for further improvement along the lines of uniformity and fuel consumption. It is believed that a simple and practical operation schedule, with an additional repair schedule, in preference to haphazard firing and furnace maintenance would promote uniformity to a constant factor. These two schedules, together with the necessary modifications, covering a wide range of oxidation and small to large heats, will be based upon the results of extensive and varied experiments with large and small heats. The idea is to curb unsound practice by using a constant fuel rate with a definite air volume, in connection with a predetermined melting period for any given heat.

The writer has tried to bring out the following outstanding features in connection with the melting process of malleable iron with fuel and oil:

1. The absolute necessity of proper combustion and heat control.
2. Control of charge and elements, through desired oxidation, to insure uniformity of product.
3. Virtual control of element of time.
4. Decided economy of repair labor and costly materials in furnace maintenance.
5. Elimination to a greater extent of the human element in furnace operation.

A number of other important features are not covered in this article such as elimination of excess labor in furnace operation, handling of raw and waste materials and other items of a more or less degree of value. As indicated in the beginning, this paper has been written from facts and results obtained during a number of years of practical experience and laboratory research work.

From Claybank to Steelworks

How an Englishman "with Dundrearies" and a Philadelphia Merchant Established a Historical Institution in American Industry—Interesting Sidelights on Progress from the Midvale's Record

ON A SUNDAY morning, shortly after the Civil war, a prominent Philadelphia iron merchant, accompanied by an English visitor, adorned with the flowing whiskers then called "Dundrearies," sauntered across a field in Nicetown, as the southern part of Germantown, Pa., was known in those days. The neighborhood was largely devoted to brickmaking, and on the edge of a clay pit they found, resting, a man with whom they entered into conversation. He was familiar with the environment, and, in answer to their questions as to the nature of the soil, etc., expressed the opinion that one would not need to go deep to find water.

A bargain was struck and the man agreed to dig a hole and to continue digging until he struck water, assuring them that if they would return the next day, his part of the contract would be completed. He went spade-deep at the bottom of the clay pit, a few feet below the general ground level, and, as he expected, struck water, which he showed his visitors on their return the following day.

They were Philip S. Justice of Philadelphia, and William Butcher, a member of an English family of steelmakers, who had come to this country and interested the Philadelphia merchant in a project for the establishment of a steelworks for the manufacture of weldless steel "tyres."

The location at Nicetown was selected because of its proximity to the Reading railroad, connecting with the anthracite coal region, the Schuylkill river at the falls and the Delaware river, tidewater, at Port Richmond. The Philadelphia, Germantown & Norristown railroad passed the site and intersected the Pennsylvania railroad at a short distance to the south.

The easily available coal supply had more weight with Justice and Butcher than the marshy character of the ground. This proved a serious obstacle to economy in building and in operation and so remained until that part of Philadelphia was drained. Frantic efforts were made in time of flood to keep the water out of the gas house pit and the open-hearth checkers by pumping. The projectors had been forewarned of this condition by Harry Gilbert's experimental excavation, who was, in fact, the very first employe of the Midvale Steel Co.

Under date of Nov. 16, 1866, the land, about seven acres, was deeded to William Butcher. This acreage has increased more than eight-fold. During the winter of 1866-67, work on the first buildings was begun. These included the crucible melting shop, the location of which is now covered by the west end of the tire mill and forge buildings. Its roof was supported by wooden trusses with a span of 110 feet, said to have been at that time the longest wooden trussed span in this country. John Batteaux, who still is an employe of the company, helped on this construction.

On May 10, 1867, the stock of "The William Butcher Steel Works of Philadelphia" was subscribed, on June 18, 1867, the charter was issued and the company started officially on its career.

The works were originally designed for the manufacture of tires from crucible steel, the tariff on which, at that time was higher than has been the selling price sometimes since. Ingots were made at the pot fires. The converting furnace, for the preparation of blister bar, the mixing room, etc., and the melting shop were at the west end, the hammers, tire mill and machine shop lying to the eastward, with the shipping wharf, such as it was, alongside the latter.

At that time cast steel frogs entered largely into railway construction and the William Butcher Steel Works made many thousands of them, the quality of which left little to be desired. For this purpose a moulding shop was erected north of the melting shop and connected with it by a tunnel. It was afterward connected by a similar tunnel with the open-hearth when this was built.

By the spring of 1867 the melting shop was completed and "No. 1 Tire Mill," built in England by Galloway Bros., was installed, with its engines. This mill did good work and the fact that it is today practically as good as when it was built speaks volumes for the ability and foresight of its builders. In the machine shops a drill press, imported from England at the same time, and a 60-inch boring mill erected in 1868 by the Philadelphia firm of Bement & Dougherty, still are in operation.

When the crucible melting shop started in the spring of 1867 with John Lentz, as melter, Peter McAnally, "Mr. Mac," came to the works. His experience from that time at the pot fires and subsequently at the various open-hearth and crucible furnaces, covers the whole metallurgical history of Midvale.

The organization in the melting department consisted of the mixer, Frederick West Bennett, known as "Fred West," who was certainly a good

An Authoritative Chronology

FIFTY-SIX years' of steelmaking in the United States" might be the title of the accompanying article, dealing as it does with the events in the life of the Midvale Steel Co., or the Midvale Co., as it is now called. This presents an interesting phase of the development of the iron and steel industry, reveals some of the obstacles that beset pioneer steelmakers; how steelmaking advanced from a crude, rule-of-thumb process to an exact scientific method for production in large quantities, all within the lifetime of some of the employes of the company. It is not generally known that Frederick Winslow Taylor, whose teachings on the subject of scientific management have become so widely adopted in all branches of industry began his work along this line for the Midvale Steel Co. The article is a narrative of human, as well as mechanical progress. The company began operations June 18, 1867 *as the William Butcher Steel Works Co., of Philadelphia; became the Midvale Steel Works Sept.* 16, 1872, *the Midvale Steel Co., Dec.* 14, 1880, *and in* 1915, *the Midvale Steel & Ordnance Co. Aquisition of a large portion of the company's interests by the Bethlehem Steel Corp., and the formation of the present Midvale Co., are matters of more recent date.*

"mixer," though not as meant by modern slang; melter, John Lontz and molder, John "Jack" Slattery.

The mixtures were all dictated by William Butcher, who left no record of his formulae. As there was no laboratory, chemical or physical, the methods were entirely "rule of thumb." The first castings made in the crucibles were lead blooms with which to try out the new tire mill. If they were subsequently shipped, no record of their service has been found.

The first tires were rolled from blooms imported from England, but almost immediately crucible ingots were cast in the new melting shop and punched and beaked under a hammer at the Bush Hill Iron Works of Matthews & Moore.

In 1868, No. 1 Hammer, 7 tons, was contracted for with William Sellers & Co., and, as this and other machine tools were paid for partly in stock, William Sellers, afterward its president, was brought into the company. For the next few years the output consisted of castings, which were generally profitable, and tires, which, because of management characterized subsequently as "reckless and utterly wanting in system," were unprofitable.

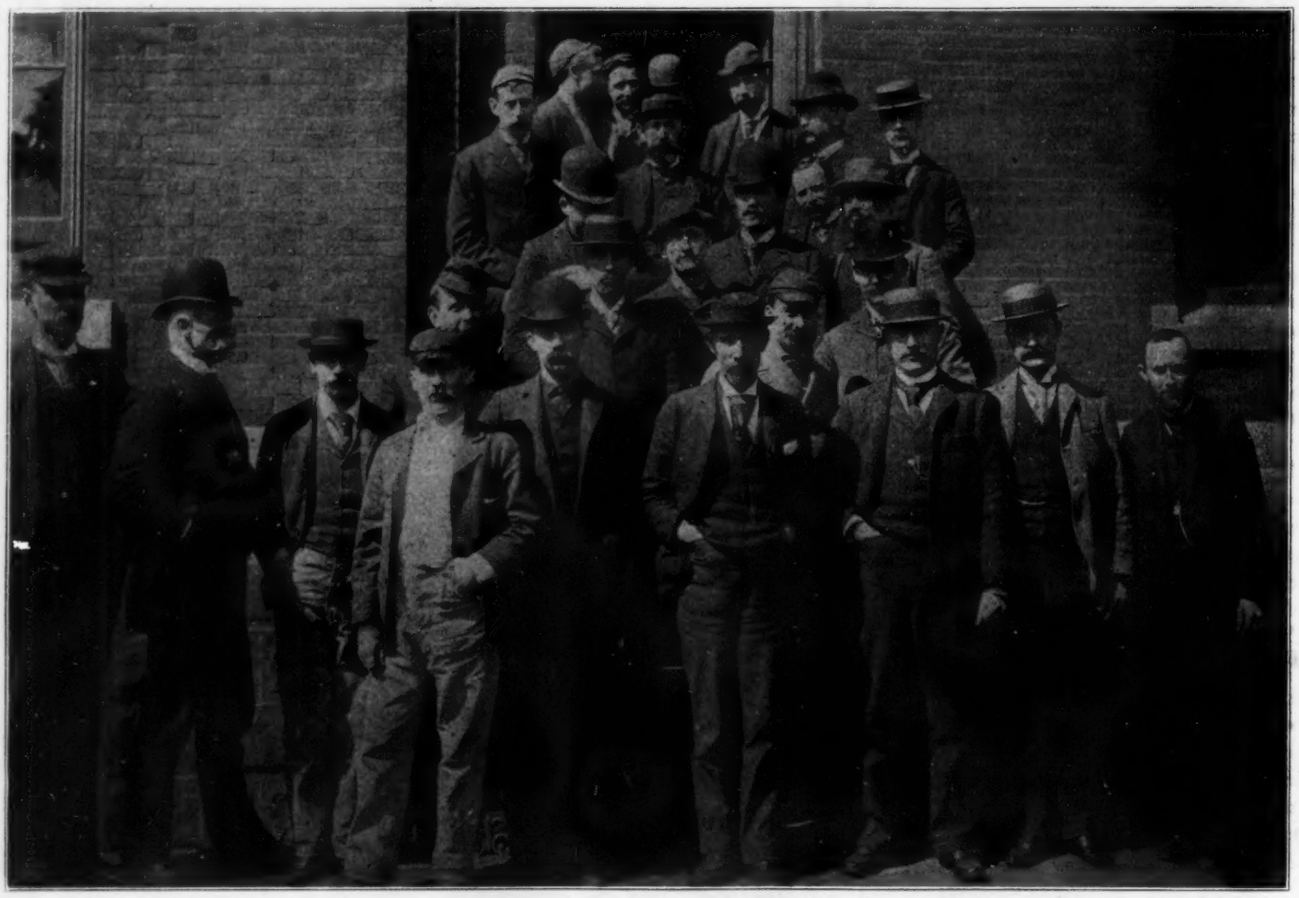
Even at that early date the works put on the market cast steel car wheels which, according to a report of tests by A. Whitney & Sons in 1867, were of excellent quality. The first departure from these lines occurred in 1870, when a contract was entered into with the Keystone Bridge Co. to furnish about 2400 tons of steel for the Eads bridge over the Mississippi river at St. Louis. This was the first steel bridge erected in this country, but brought the works little return beside experience and scrap.

In February, 1869, Col. James Thompson arrived at Midvale and assumed the duties of shipping clerk for the whole works, shared the watchman's responsibility with Harry Gilbert, calculated all weights, selected all blooms, received all material, was timekeeper and storekeeper; in short, took care of the interests of the company in every corner inside the fence. He did not burden himself with the sales department, and, perhaps for this reason, in the next few years the business of the company languished.

In 1869-70, No. 1 open-hearth furnace was constructed under a license to use the siemens patents, and the first heat was run in January, 1871. At that time there were only one or two open-hearth "siemens-martin" furnaces in existence in this country and their operators knew little more than did the men at Nicetown.

The capacity of No. 1 was only 3½ tons, but it gave the men more trouble than does an 80-ton furnace today. Their difficulty was not lessened by the erection of another experimental open-hearth, the "Dolly" or "Sellers," which had a short life. Up to Sept. 9, 1871, 92 heats had been run on No. 1 with varying success and on that date William Butcher caused the furnace to be shut down.

Years afterward there projected above the surface of the ground, about 40 feet from the southwest corner of the old main office, a ragged steel snag, sometimes useful as a hitching post. Its lower end was a 3 or 4-ton "salamander" which tradition said was the first heat at No. 1 furnace. When the gang had undertaken to pour the heat, they had managed to open the tapping hole, partly. The steel slowly trickled



IN THE EARLY DAYS OF THE MIDVALE STEEL CO.

Some of the employes and officials of the company are mentioned in the accompanying article. First row, left to right: William P. Barba, Col. David A. Lyle, William E. Firth, Joseph B. King, Henry L. Gantt, deceased, James Thompson, deceased; Charles J. Harrah, Axel Petre; John C. Dessalet, deceased. Second row, left to right: Edward W. Farnum; Timothy Coonahan, deceased; John L. Cox, Charles H. Gummey, Dr. Charles A. Currie. Third row, left to right: George H. Chase; Henri A. Brustlein, deceased; Charles C. Warren; Jules DeChandon, French inspector, deceased. Fourth row, left to right: George Ralston, Carl H. Satherberg; Peter McAnally, deceased; George W. Sinclair. Fifth row, left to right: Radcliffe Furness; Samuel Martin, deceased; Harry M. Deemer, deceased; Henry D. Booth

down the long spout, then froze, and efforts to open up were unavailing. Finally, the gas was shut off, the bath allowed to chill completely, the furnace torn down, the salamander jacked up, hauled away and heaved over the bank. It remained for many years a monument marking the tomb of No. 1 open hearth's first-born.

Establish New Records

In the summer of 1872 the name of the company was changed from William Butcher Steel Works of Philadelphia to the Midvale Steel Works. On July 10, 1872 Charles A. Brinley came to Midvale as chemist. At that time in steelworks "chemists" were as rare as were safety engineers ten years ago, and this date may fairly be said to mark the period at which Midvale began its advance.

Butcher had been succeeded as superintendent by William F. Furfee. The latter's first undertaking seems to have been to rebuild No. 1 open-hearth furnace. On Dec. 27, 1872, a heat was run under Brinley's charge, which was called "Heat No. 1," disregarding the heats which had been run by Butcher.

On his arrival, five months before, Brinley had found practically no records by which any material on the ground could be identified. Swedish bar iron at the converting furnace and blister bar in the bins at the mixing room were fairly recognizable, but around the yard were scattered piles of pig iron and scrap without distinguishing marks or records. Fortunately there came to Brinley's rescue one "Mickey" Kelly in whose memory had stuck statistics about these materials, although he had no responsibility regarding them.

A chemical laboratory had already been equipped some years previously. It was not very busy and Brinley and Kelly went through the yard from pile to pile of material, marking each with a numbered sign and noting all the information at Kelly's command. Brinley then selected samples, took them to the laboratory and analyzed them. The results thus obtained formed a fairly dependable record on which the open-hearth metallurgy could be based.

Heat No. 5 was run Jan. 1, 1873, and with this heat, Brinley started the "Open-Hearth Journal," in practically the same form as used today. From this time forward, not a month passed without improvement in orderliness and system throughout the works; and, while in those days "safety first" and similar doctrines were only dimly recognized, great progress was made in the direction toward which such principles lead.

Under the expert management of Col. Thompson, the tire business, which had dwindled to worse than nothing, began to grow again and later Midvale always had its share of any business that was to be had.

Brinley who had taken charge of the steelmaking was appointed superintendent in 1874. The old records show under his supervision experiments in "basic practice," dephosphorization, in 1873-74.

The manufacture of steel axles was started in 1872-73 and the Pennsylvania railroad business was secured in 1874. Previously, practically all the steel axles used in this country had come from abroad. In 1875 a series of experiments were carried out under the auspices of the Railway Master Mechanics' association at the works of John Roach, New York City, to determine the relative value of steel and iron axles. It was written at that time:

"The results of these experiments were regarded as convincing proof of the great superiority of low steel over iron for axles, rails and other purposes wherein metal is designed not only to sustain dead pressure but also shock and vibration."

The steel axles used in the experiments were supplied by Midvale. John Roach's works was selected for the tests because it contained a testing apparatus, or "drop," suitable for the purpose. Because the tup, or falling weight, of this drop weighed about 1640 pounds, that weight was practically adopted as a standard and remained so for all axle drop tests for many years.

Made Steel For Ordnance in 1875

The manufacture of steel for ordnance was begun in 1875. The first order from the United States navy to an American manufacturer was entered by Midvale on March 18, of that year, as order 6618. It called for 3-inch howitzers. Such complicated forgings were outside the experience of the company's forge and the work was not completed until the summer of 1876. It was then done by George Roxborough, a skilled hammerman brought from Frankford for the special purpose.

On some extra guns made on this order, Midvale experimented in heat treatment, quenching in both water and oil and annealing. The results were satisfactory and instructive. This was the first work of this description done in the United States.

In 1875 work on verbal orders was forbidden and a system of written time notes installed, another long step in the direction of safety, although perhaps not recognized as such at the time. In 1876, piecework was introduced, with results beneficial equally to employer and employed, as the experience of nearly 40 years has proved. During this same year was adopted the practice of making tensile tests for the purpose of "passing" steel for special purposes, although test ingots were not cast on every heat until some years subsequently.

In 1877 Axel Petre, afterwards its general manager, entered the service of the company. Almost his first job as a constructing engineer was to design and erect a fire screen, or shield, installed under the wooden roof of the melting shop over an oil tank to be used in oil tempering hollow forgings, the desirability of which treatment had been indicated by the results obtained in howitzers. This shield was supposed to protect the roof from danger of fire.

Quenching Gives Trouble

That the precaution was not unnecessary appeared from the result. When the tube was lowered slowly by a hand crane into the oil, before more than a few inches had been submerged the whole contents of the tank caught fire and it was with difficulty that the piece was withdrawn, untempered, and the volunteer fire department—the whole works force—succeeded after heroic efforts in extinguishing the blaze.

At the next attempt "safety first" was the watchword. A cylindrical furnace, somewhat like the Norsemen's tower at Newport, was erected in the yard. Above its grate bars were two supporting bars on which was stood, vertically, a small gun jacket, or ring. The practice which followed was a partial imitation of hearsay description of a similar operation in a foreign steelworks.

A coke fire about a foot deep was kindled on the grate bars. Other coke was brought to a state of incandescence on temporary grate bars arranged on trestles or horses on the outside of the furnace. This incandescent coke was shoveled in the top of the furnace with additions of unlighted coke, with the idea that the whole mass could be brought to the same temperature and thus evenly heat the piece. It didn't; and the official who had started the fire at 3 a. m. with the intention of having the jacket ready to draw at 8 a. m., found himself far from the accomplishment of his purpose at that hour.

Borrowing an idea from Biddy and the kitchen range, he filled a number of second-heat pots with "carbon oil," stood them around the rim of the furnace and pushed them over in the mass of burning coke. The result was what might have been expected and the conflagration was magnificient; but when the tube was drawn, with parts of the supporting bars sticking to it, the lower end was "burnt" while the upper end was a "dark cherry." These were "pyrometer readings" in 1877. Nevertheless, the piece was dipped and subsequently annealed and the results

of the test were not uninstructive. Test bars were taken from various parts of the tube, and while parts of it were altogether wrong, some of it was nearly right.

F. W. Taylor Arrives

Not long after Mr. Petre's arrival, F. W. Taylor, afterwards famous as an "efficiency engineer," entered Midvale's employ. He had served his apprenticeship in another Philadelphia machine shop. His first job at Midvale was in the machine shop tool room, issuing tools to machinists. From this subordinate occupation he progressed through various positions of gang boss, foreman, etc., until when he left the works in 1890, he was its chief engineer.

When Taylor came to Midvale, he found piecework systems established by Brinley, and co-operated in extending and elaborating these, particularly as applied to operations in machine shops. Brinley inaugurated the "differential" piece rate system under which a rate was based upon what was considered a fair output. When this output increased, the rate for each unit was also increased so that the workman's increased earnings were more than proportionate to the increased production. Taylor did admirable work in developing and perfecting this whole system by careful and exact time studies, records, etc.

In 1879 a contract was made for rolling the steel for the superstructure for the Brooklyn bridge. This work which was done under Mr. Petre's special supervision, marked the beginning of another era in Midvale's history. Not only was the Brooklyn bridge a conspicuous development in bridge building, but the rolling of such beams and channels direct from steel billets of rectangular cross section was unique.

In 1879 construction of a 12-ton open-hearth furnace was begun. This was a considerable advance over the 3½-ton furnace constructed 10 years previously and was called "No. 20 Open-hearth," the furnace designed by William Sellers and nicknamed "Dolly" having had a short life in the interim.

Stack Built on a Slant

After No. 1 and No. 2 open-hearth furnaces had been running some years on the same stack, as they had suffered from insufficient draft, it was decided to increase the height of the stack, which was of brick construction. The same thing had been done successfully for No 1 boiler house without interrupting operation, and the practice was repeated at the open hearth.

The consequences would have been disastrous had not Taylor been prudent enough to take observations with a transit, thus ascertaining that the stack was out of plumb to such an extent that if it had been exended 40 or 50 feet, the upper part would have been outside the center of gravity and the whole would have collapsed. To avoid this danger, the extension was inclined at a reverse angle. The stack thus constructed stood safe for many years but was by no means a thing of beauty when viewed from certain angles.

In 1880 the Midvale Steel Co. succeeded the Midvale Steel Works; a change in title but not in management. During that year arrangements were made with the Germantown hospital for a special bed, ambulance service, etc., for men injured at Midvale, and the hospital was directly connected with the works by telephone, a recent invention in the industrial world. "Safety" was receiving more and more attention during these years.

By January 1883 the "Midvale Beneficial association" was ready to function. Its records show a small part of the good which it has accomplished for its members, but the indirect benefits, though many and great, in prevention and avoidance of accidents, cannot be recorded.

Electric Lights Installed in 1881

In 1881 a dynamo for electric lights was installed. This also was a novelty in steelworks operation. The present generation finds it hard to understand how night work could have been carried on with the doubtful aid of dim lanterns and smoky torches, though some work was accomplished by such means.

A new main office was designed by Brinley, but he did not stay long enough to move into the promised land, as the office was not erected until 1883. At that time it housed the laboratory and drafting room in addition to the executive and accounting offices. It was located approximately at the corner of Bristol and Blabon streets on the old city maps. In 1916 it was torn down to make room for extensions needed for the manufacture of projectiles and shells.

In 1882, Brinley left Midvale, for whose "place in the sun" he was responsible, to take the management of the Franklin Sugar Refineries. He is now the president of the American Pulley Co., a "neighbor" of the Midvale Co.

He was succeeded as superintendent by R. W. Davenport, who had come to the works as chemist in 1874.

Midvale's first locomotive was bought in 1886. Before this, all cars were "spotted" by Reading locomotives and all local shifting of cars and bogies was done by hand. In 1887 the works were connected with the superintendent's house by telephone. Previous to this time there had been intercommunication telephone service between various shops in the works but no outside telephonic connection except the line to the hospital. As in the case of electric lighting, it is hard to realize now how business was carried on in those days with such insufficient means.

Company Changes Hands

In the latter part of 1886 the ownership of the majority of stock of the Midvale Steel Co. changed, and early in 1887, Charles J. Harrah and Charles J. Harrah Jr., assumed the management, the former being elected president.

R. W. Davenport was appointed manager and G. Aertsen, superintendent. In the autumn of that year Aertson withdrew from the company to take charge of the open-hearth department of the Homestead Steel Works, and was succeeded as superintendent by Axel Petre, who remained in charge of the Midvale plant for nearly 30 years, as Davenport left in 1888 to go to Midvale's powerful competitor, the Bethlehem Steel Co.

During Mr. Petre's administration much progress was made by Midvale in extending the variety of its output, particularly in the way of armor plate, ordnance and similar materials for the United States government, as is illustrated by the following record:

In 1891 the directors considered the questions of the erection of a gun shop, and of equipping for the manufacture of armor plate. In the same year an arrangement was consummated with Jacob Holtzer & Co. of St. Etienne, France for the manufacture of projectiles. M. Henri Brustlein was Messrs. Holtzer's representative at Midvale and during his stay there he gave Midvale the formulae which were the basis of what Midvale developed into the modern high-speed tool steels, alloys containing chromium and tungsten.

Midvale made great progress in perfecting high-speed steels, and shipped large quantities to the Bethlehem company, F. W. Taylor, who had gone to Bethlehem from Midvale in 1890, worked upon the steels with Maunsel White and H. L. Gantt, the results of their experimenting being the "Taylor-White" patents for heat-treating such alloys.

In 1900 work was begun on marine engines and on finished gun carriages for the United States army. In the same year Midvale submitted its first bid for armor plate for the United States, although its first contract was not closed until Dec. 15, 1903.

Develop Nickel Alloys

In 1903 work was begun on finished guns and mounts for the United States navy.

In 1904 experimental work on armor plate resulted in developing the nickel

chrome steel alloys, which have since played so important a part in forgings for automobiles. Midvale was the first steelmaker in this country to attempt to introduce these alloys to any considerable extent.

In 1906 a proposal for armor plate for the Italian government was closed and work was begun on the contract.

In 1910 the capital stock of the company was increased from $750,000 to $9,750,000. On June 21, 1910, a safety committee was instituted to look after accident prevention, safety appliances, etc. The work of this committee and the bureau of safety has been attended with gratifying results. In 1911 Mr. Petre was appointed general manager and W. P. Barba, superintendent. In 1914, Mr. Petre resigned as general manager, being succeeded by Mr. Barba, who was in turn succeeded as superintendent by George Satterthwaite.

In June, 1914 an apprentice school was started with one instructor and a roster of 125 students. In June, 1917, this school had two instructors and a roster of 225 students with an attendance of practically 100 per cent.

The outbreak of the war in Europe in August 1914, did not at once affect Midvale's business, as no effort was made to engage in the manufacture of munitions for belligerents. Work proceeded without noticeable change until September 1915, when practically the entire capital stock of the Midvale Steel Co. was purchased by the Midvale Steel & Ordnance Co. and the old board of directors was succeeded by the present board. The new management entered largely into the manufacture of supplies for the entente allies as well as for the United States government, accepting large orders for armor piercing projectiles, high explosive shells, artillery of all calibers, both finished and in the rough, and also armor plate for the United States. This necessitated a considerable addition to the plant, which now covers about 58 acres. Several new shops have been erected in which have been installed machinery for the complete fabrication of shells and projectiles, as well as finished artillery of all calibers and descriptions, with accessories.

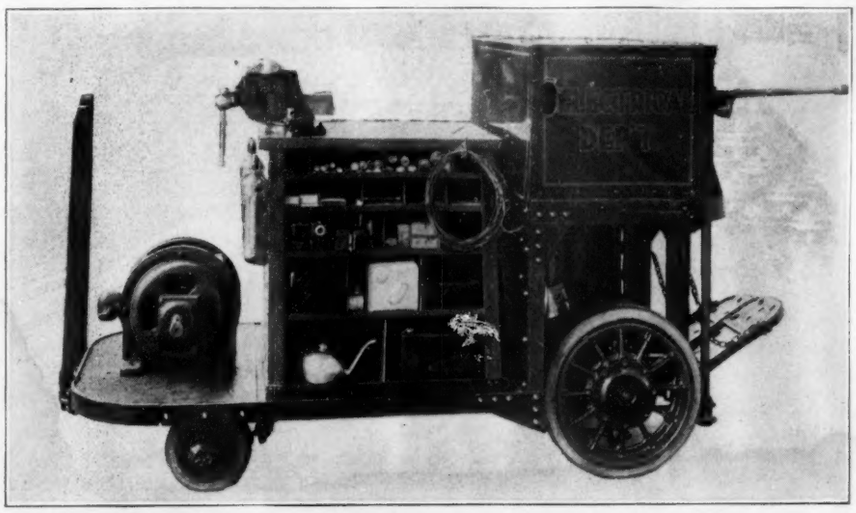
An artillery machine shop, No. 7, and the present main office building were erected upon land purchased in 1916.

Fifty years ago most of Midvale's executive and engineering force, with its accounting departments, was housed in a two-story cottage containing six rooms with a total floor space of about 3500 square feet. In 1917 these forces filled a building, seven stories high, with a total floor space of about 57,000 square feet.

The retrospect of a man's life is a melancholy task, because, for good or for evil, it is over—there is nothing more. The retrospect of the life of a corporation like Midvale is far different. It is the history of honest endeavors, some failures, some successes, but always progressive, continuing through many generations, and in some form or another perpetually part of an ever-growing industry.

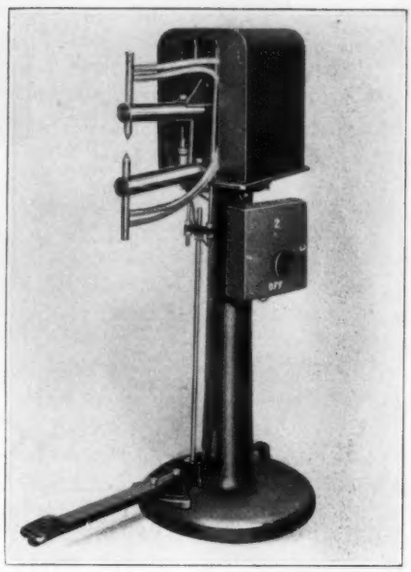
Truck Carries Emergency Repair Equipment

A breakdown at any point of the mill or factory where the service of electricians are needed on short notice, always is attended with considerable confusion. The necessary equipment usually is located in the repair department, so that assembly is of first consideration, but delivery on the job often is more difficult. The importance of having an assembly of first aid equipment ready for dispatch to any point in the plant at a moment's notice is a well known fact. At many shipyards, mills and factories, a standardization of motors has been accomplished, making it important to have an extra motor to replace any that may get out of order. Other articles that should be ready for instant use include belting, belt fasteners, lamp bulbs, carbons, bearings, bushings, a tool kit, a supply of grease and a fire extinguisher.



ELECTRIC TRUCK USED TO TRANSPORT MATERIALS FOR REPAIRS TO ALL PARTS OF THE MILL

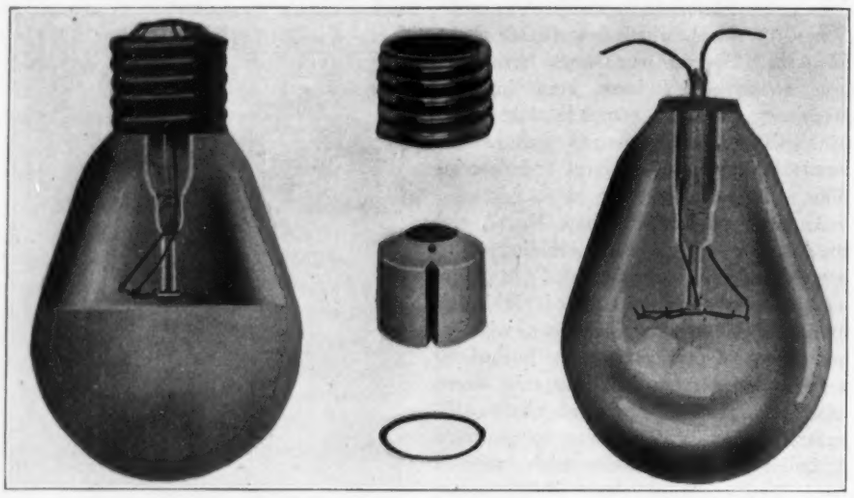
To supply the manufacturer with an industrial truck suited to this purpose the Elwell-Parker Electric Co., Cleveland, recently has introduced the truck which is shown in the accompanying illustration. As will be noted a steel or wood case occupies about two thirds of the platform while the balance is reserved for a motor and tool kit, with room for one or two repairmen to ride. A pipe vise is mounted on the partioned rack to accommodate the usual emergency equipment. The truck is driven by a battery carried in a large compartment over the drive wheels.



SPOT WELDING MACHINE USES ALTERNATING CURRENT

Designs Electric Spot Welding Machine

An electric spot welding machine designed primarily for operation on alternating current but which also is adaptable, by means of a special device, to the use of direct current, recently has been developed by the H. J. Ness Mfg. Co., 305 Broadway, New York. One of the features of this machine, which is shown in the accompanying illustration, is that the transformer is located within two inches of the rear ends of both horns and midway between them, thereby decreasing the losses, it is claimed. The electrodes also are heated more uniformly since the lead to each is about the same length. Tests have



LIGHT BULB HAVING BRASS RING WHICH PREVENTS THEFT

shown that from No. 30 wire to a ½-inch rod may be welded on the standard machine with a 10-ampere fuse, in the line, indicating that the current consumption does not exceed 10 amperes.

Another feature of the equipment is an oil dashpot switch which is said practically to eliminate sparking at the switch points and thus lessen the deterioration of these points. The equipment also is made sensitive by the reduction of the lag between the switch and the electrodes. The upper horn is carried by a rocking arm and is lowered to the work by depressing the foot pedal. The upper electrode comes in contact with the work under spring pressure, the spring being further depressed until the current is turned on. The work is brought immediately to the welding temperature, and the current then automatically turned off. The weld is completed under a spring pressure that is adjustable to suit conditions.

Three welding steps for each voltage are obtained, by means of a selector switch, to suit the different thicknesses of material handled. A voltage of 110 or 220 may be supplied the machine and more steps are optional. There are seven adjustments to the machine for regulating the height between the horns, the pressure applied to the electrodes in welding, etc. The treadle position may be shifted 35 degrees to suit the convenience of the operator. The horns consist of copper bars, which are adjustable and water cooled. The electrodes are secured to the horns by means of a hand operated lever and a cam lock.

Introduces Theft-Proof Light Bulb

It is estimated that from 15 to 30 per cent of the electric light bulbs used by railroads, industrial plants, ships, stores and public places are stolen. One railroad claims an annual loss of $13,000, and reports from a hotel association show that over 1,000,000 bulbs are stolen in a year from its members. This loss practically is doubled by the cost in time and labor required to make replacements.

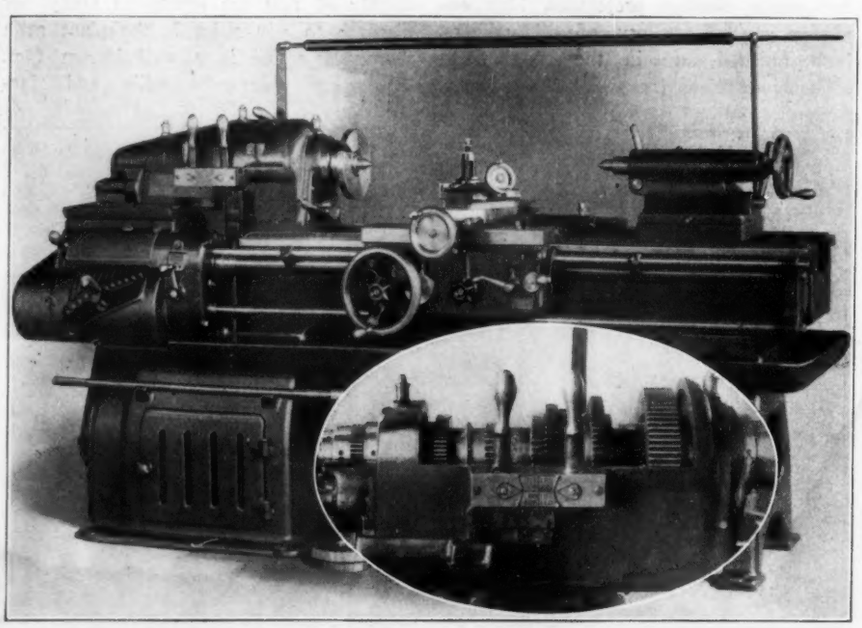
A new bulb designed to prevent such loss recently has been placed on the market by Lester Kulp, 143 West Austin avenue, Chicago. The construction of this new lamp is simple, there being no guards, locks, keys, springs, or other mechanisms. The accompanying illustration shows the method of making the lamp theft proof.

One contact at the top is the same as in an ordinary lamp. The other contact is a brass ring fastened at the bottom of the porcelain plug. This plug has a groove filled with plaster of paris which holds the brass shell in place. After the lamp has been screwed in the socket an extra turn breaks the plaster of paris seal, enabling the lamp to turn freely in the shell and at the same time maintain the electrical contact. The shell cannot be turned in the socket. It is claimed that the shell screws up so close to the socket that tools cannot grasp it, and when the bulb is burned out it can easily be removed for replacement.

New Features Embodied in 16-inch Lathe

Simplicity of design and convenience of operation are the features of a 16-inch lathe recently introduced by the Pratt & Whitney Co., Hartford, Conn. The lathe is primarily designed for an individual motor drive, using a geared head, although it is readily adaptable to single pulley drive or cone head with countershaft drive. The motor drive is unique in the fact that the motor is readily accessible, but is entirely out of the way. A 5-horsepower motor is placed within the cabinet leg at the end of the lathe, and is mounted on a hinged platform, the latter acting as a belt-tightening device. The belt from the motor drives a shaft at the rear of the machine, which connects with the spindle through a friction clutch and headstock gears. The clutch is operated by a shoulder high control rod mounted at the rear of the lathe and within easy reach of the operator.

Instead of using the usual type of back gears which project out from

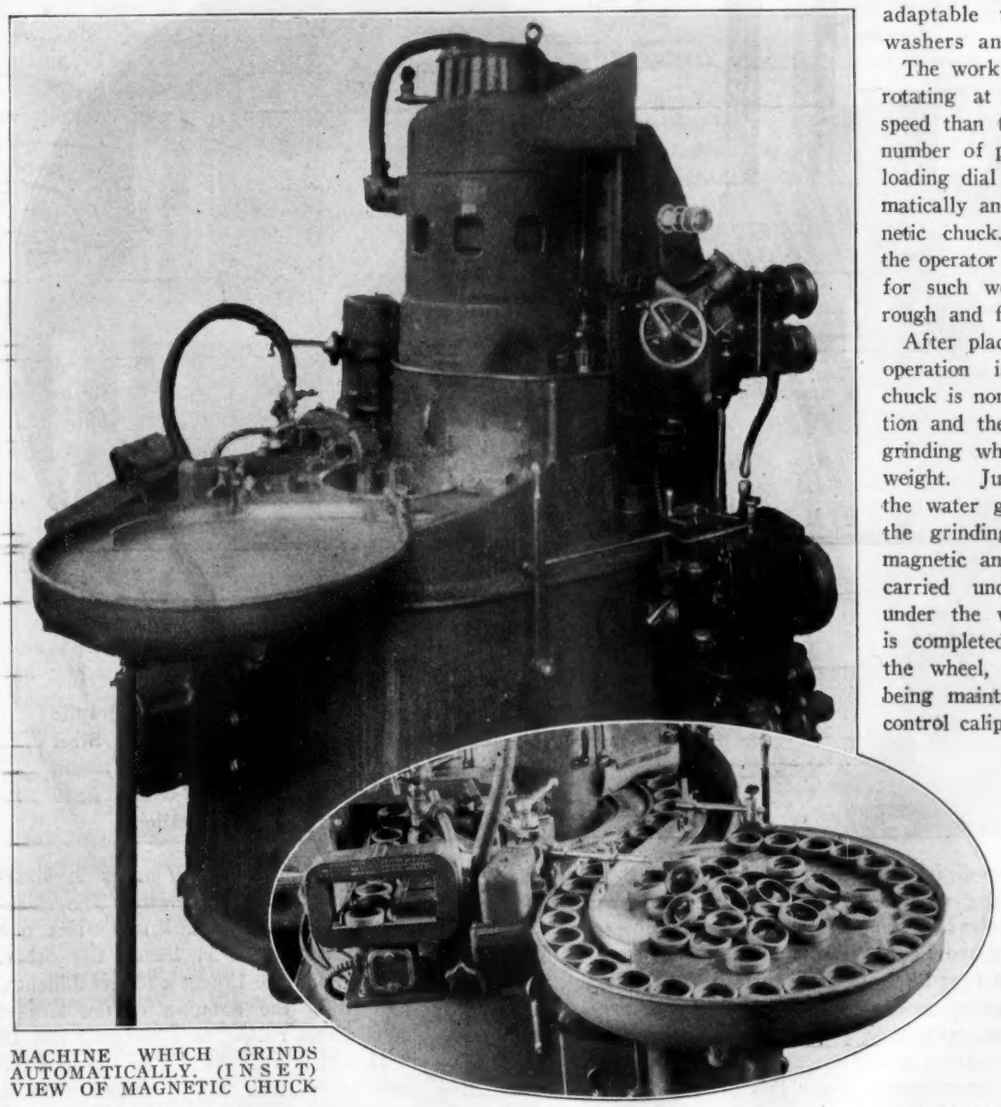


LATHE HAVING MOTOR ENCLOSED IN CABINET AT END OF MACHINE. (INSET) VIEW OF GEARING

the rear of the headstock, the back gears of this machine have been moved to a position directly beneath the spindle. In addition to the above, other changes have been made in the design of this lathe. A set of four-speed transmission gears operated by two interlocking levers on the front of the headstock provide an easy means of spindle control. These gears, working in conjunction with the back gears, produce eight spindle speeds ranging from 13 to 525 revolutions per minute in geometrical progression. The back gears are controlled by a lever located just beneath the spindle nose, while a lever on the headstock operates the back lever lock.

Driving from the spindle gears, a train of large spur gears lead down to the feed gear box on the front of the machine. By means of two levers and a direct reading index plate any desired number of threads per inch or feed per revolution may be set. Several new features are embodied in the carriage and apron design, chief among which is the device for thread cutting. This device makes it only necessary to give the handwheel a quarter turn at the end of the thread and the tool is withdrawn completely. A positive stop enables the tool to be returned to the initial depth while a graduated disk and wheel on the tool slide provide for further and accurate tool setting.

A complete line of special equipment is also available among which are included a taper attachment, relieving and forming attachments, ball turning rest, plain or elevating tool rests, chucks, collets, etc. These attachments make the lathe suitable for a wide variety of work.



MACHINE WHICH GRINDS AUTOMATICALLY. (INSET) VIEW OF MAGNETIC CHUCK

Detroit Employment Gains

Detroit, Aug. 28.—Gain of 1587 was made in the total number employed in the 79 reporting firms to the Detroit Employers' association, for the fiscal week ended Aug. 23. This is the first time in eight weeks that a gain has been shown. The total now is 219,157.

Add New Features to Automatic Grinder

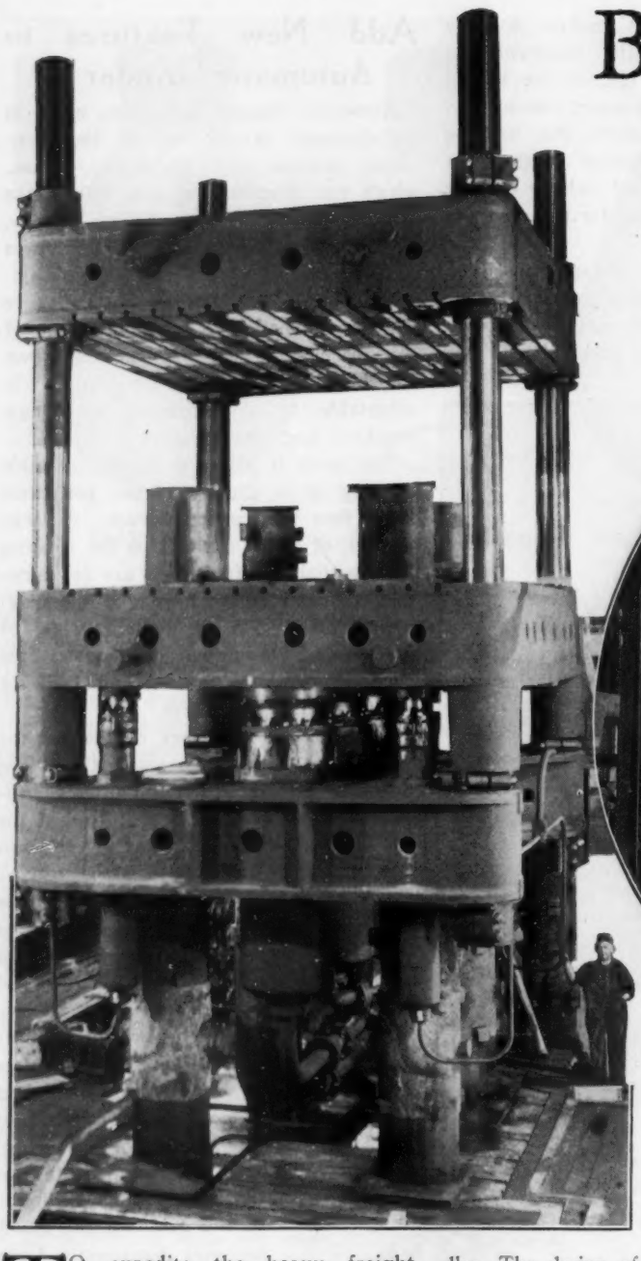
Numerous changes have been made in the automatic grinder built by the Blanchard Machine Co., Cambridge, Mass., which was described on page 669 of the March 1 issue of IRON TRADE REVIEW. The machine, as first introduced, was loaded by hand, while the grinding, maintaining of size and demagnetizing were entirely automatic. The modified form of this machine, a view of which is shown in the accompanying illustration, is adaptable to the grinding of rings, washers and similar work.

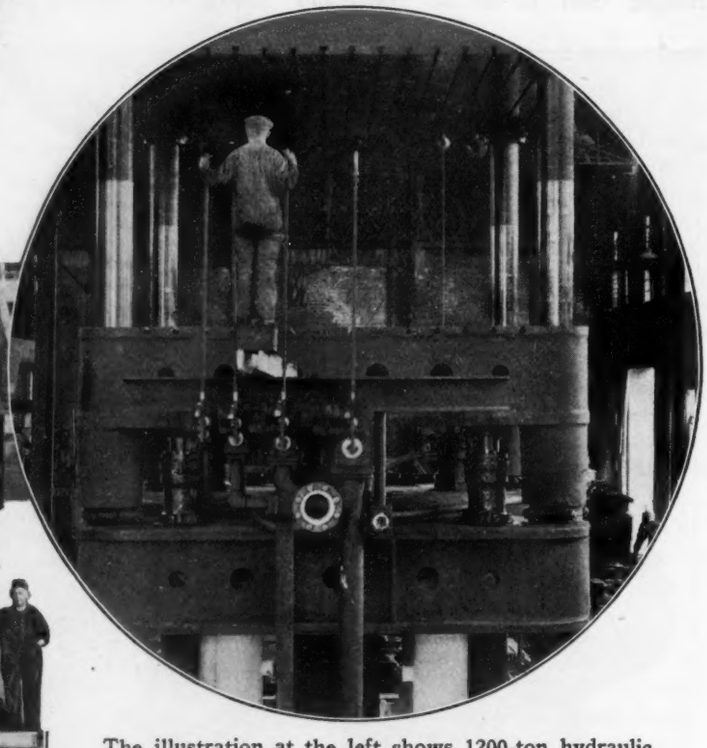
The work is placed on a circular table rotating at a slightly higher peripheral speed than the magnetic chuck. A large number of pieces are laid on the rotating loading dial and from here are fed automatically and continuously into the magnetic chuck. This makes the work of the operator intermittent and provides time for such work as moving containers or rough and finished pieces.

After placing the work on the dial the operation is entirely automatic. The chuck is nonmagnetic at the loading position and the work is carried toward the grinding wheel held in place by its own weight. Just before the work reaches the water guards, which entirely enclose the grinding wheel, the chuck becomes magnetic and the pieces are gripped and carried under the water guards and under the wheel. The grinding to size is completed during the one pass under the wheel, the exact size of the piece being maintained by an automatic wheel control caliper, which automatically makes adjustments of the wheel head to compensate for the wear. Upon completion of the grinding the chuck becomes demagnetized and the work, after passing through the demagnetizer, is discharged into the receiving containers. A washing machine may be added, enabling the machine to discharge the pieces washed and demagnetized. The machine will maintain size within limits of plus or minus .00005 inches. Four chuck speeds are provided. The base of the machine is in the form of the tank and will hold 180 gallons of coolant.

Net earnings of the American Bosch Magneto Co. for the six months ended June 30, 1922 totaled $288,000 after interest and charges. This compares favorably with a deficit of $22,500 for the like period of 1922 after a similar deduction for interest and other fixed charges.

Builds Large Press for Locomotive Boiler Work





The illustration at the left shows 1200-ton hydraulic press on the erection floor of the Birdsboro Steel Foundry & Machine Co. (Above) Control levers in place, with man standing at point where floor line will be when press is installed

TO expedite the heavy freight traffic and to permit the shortening of passenger schedules through the mountainous divisions of the Pennsylvania railroad, it has been found necessary to increase the tractive power of the heaviest locomotives. Boilers to generate higher steam pressure and of greater evaporation than ever before conceived had to be provided. Larger and heavier plates to resist the increased pressures, with fewer riveted joints had to be used to insure a high measure of safety.

The strict boiler specifications made it imperative that an extremely large flanging press of great stiffness be installed to handle this large work. To meet these requirements the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., designed and built a press of larger dimensions than any other in existence for the purpose of flanging the locomotive heads and also the saddles. The design of the bulky parts and the problems of transportation presented numerous obstacles. With the available machine tool equipment recently installed at this plant, it was possible to build this press with single-piece, machined, open-hearth steel platens. The accompanying illustrations show this press, which will be installed at the shops of the Pennsylvania railroad at Altoona, Pa.

It has a capacity of 1200 tons, using an accumulator pressure of 1500 pounds per square inch. The machine is of the moving-up type, equipped with modern labor and power-saving devices and safety appliances. The floor level in which the press will be placed, will be slightly below the face of the middle platen, which is the moving member. Because of this arrangement, the foundation pit will be 18 feet wide, 25 feet long and 18 feet deep.

The press is of the four-column type, each column being 13 inches in diameter and 30 feet in length. The clearances between columns is 15 feet one way and 11 feet 11 inches the other. The platens are 15 feet x 18 feet 3 inches, permitting the flanging of the largest steel plates rolled, as a flanging bed 15 x 15 feet is available. The top and the moving platens are provided with a multiplicity of longitudinal T-slots to accommodate bolts for fastening dies to these members.

As shown in the illustrations, the columns have long threads on the upper ends, thereby providing an adjustment between the top and moving platens of from 12 feet maximum to 5 feet minimum. The inner nuts supporting the upper platen are made in halves, and the outer nuts are split on one side to permit the use of a wedge for slackening them while they are being raised or lowered in adjusting the clearances.

Six ranges of power may be exerted

by the press, which has three main cylinders and plungers, 26 inches in diameter each, with a lift of over 6 feet. By admitting 1500 pounds accumulator pressure to the center cylinder, a tonnage of only 400 tons will be exerted on the work. If pressure is admitted to the other two 26-inch cylinders simultaneously, a thrust of 800 tons will be exerted, and by applying pressure to the three cylinders, 1200 tons will be obtained.

Furthermore it is possible to exert three additional pressures by using the four jack rams in conjunction with either of the above three pressure combinations. These rams, each 9 inches in diameter, also are used for raising and controlling the motions of the moving platen while running idly up to the work, and to perform light flanging.

An auxiliary cylinder is mounted on the center of the moving platen and moving therewith, for stripping the work from the flanging dies. The hydraulic pressure is transmitted to this cylinder through a set of swivel joints.

The press is of cast steel construction throughout, with the exception of the plungers which are of chilled iron, ground and polished, and the tension bolts which are of steel, forged from metal cast ingots made in builder's steel foundry. The total weight of the press is over 300 tons.

Control Is Flexible

The controlling valves are of the balanced metal seated type, of ample size to reduce friction and to obtain rapid up and down speeds. The working speeds stipulated while lifting and lowering the moving platen, up and off the work, are 25 feet per minute.

Tank water, for prefilling the three main cylinders, will be supplied from an auxiliary tank, not shown in the illustrations, but which will be located approximately 20 feet above the floor level, while accumulators pressure will be applied to the jack rams only. In this manner, it will be possible to lift the moving platen through the full stroke by using approximately 80 gallons of water at 1500 pounds pressure, whereas if accumulator water were used on the three main cylinders, 500 gallons would be required.

A unique valve arrangement, requiring the unusually precise machine work is employed. All the valves are hand-operated, with a minimum number of packings. The valve bodies are of forged steel, bored from the solid, and containing bronze spindles and seats. One three-way valve is used for raising, checking and lowering the stripper ram while another similar valve is used for controlling it and the jack cylinder. One special valve for filling, cutting off the access to tank, applying pressure, releasing pressure and exhausting the main cylinder, is used. A fourth valve of large dimensions is used for filling the two outside 26-inch cylinders, cutting off communication between these cylinders and the tank, applying 1500 pounds pressure, releasing the pressure and exhausting the two side cylinders. All piping between the valves and the cylinders is either of open-hearth steel castings or double extra-strong pipe.

Beehive Coke Makes Slight Gain

Washington, Aug. 28.—There was a small increase in the production of beehive coke in the week ended Aug. 18, but the rate of production remains about 10 per cent below the July level, according to estimates of the geological survey. Preliminary estimates, based on the number of cars loaded on the principal coke-carrying railroads, place the total for the week ended August 18 at 336,000 net tons, against 327,000 tons in the week preceding. The comparative week record of beehive coke follows:

	Week ended Aug.18, 1923(a)	Aug.11 1923(b)	Aug.19, 1922
Pennsylvania and Ohio	278,000	270,000	94,000
West Virginia	19,000	21,000	6,000
Ala., Ky., Tenn. & Co.	17,000	16,000	6,006
Virginia	10,000	10,000	4,000
Colorado and New Mexico	6,000	5,000	6,000
Washington and Utah	6,000	5,000	4,000
United States total	336,000	327,000	120,000
Daily average	56,000	55,000	20,000

(a) Subect to revision. (b) Revised from last report.

The production of soft coal is increasing. For the week ended Aug. 11, the output is estimated at 11,000,000 tons.

Quigley Fuel Systems, Inc. Appoints Sales Agent

Fuller Engineering Co. will act as sole licensee in the United States and Canada for all new business of the Quigley Fuel Systems, Inc., following the consummation of an agreement to that effect between the two companies recently.

The engineering personnel of the Quigley Fuel Systems, Inc., has become associated with the Fuller Engineering Co. and now is in better position to render more complete engineering services, as by this arrangement designs can be presented from a wider selection of pulverized fuel equipment.

In the future all business of the Quigley corporation will be conducted through the main and branch offices of the Fuller company.

Steel Casting Sales Drop 33.9 Per Cent in July

Washington, Aug. 28.—July sales of steel castings were the smallest of any month in the past year, totaling 52,066 tons, or 53.7 per cent of capacity, according to figures issued by the bureau of census in co-operation with the Steel Founders' society. This is a decided drop from the 84,878-ton total of June, and is less than half the bookings of the peak month of March when sales reached 143,564 tons. The drop was in part due to the fact that two companies with a capacity of 785 tons a month on miscellaneous castings went out of business. Miscellaneous castings booked totaled 35,325 tons or at 60.3 per cent of capacity. The sharpest decline was in railway specialties where but 16,741 tons, or 43.7 per cent of capacity were booked in July as compared to 42,773 tons, or 111.7 per cent of capacity in June. The accompanying figures are based on reports submitted by companies representing over two-thirds of the commercial castings capacity of the United States.

	Total Net tons	Per cent capacity	Railway Specialties net tons	Miscellaneous net tons
1922				
July	66,166	68.3	32,372	33,794
Aug.	63,416	65.4	21,843	41,573
Sept.	97,919	101.1	56,781	41,138
Oct.	75,709	78.1	34,276	41,433
Nov.	60,899	62.8	22,131	38,768
Dec.	68,889	71.1	28,271	40,618
1923				
Jan.	100,605	103.8	47,879	52,726
Feb.	90,152	93.0	39,845	50,307
Mar.	143,564	148.2	76,409	67,155
April	90,968	93.9	39,610	51,358
May	89,493	92.4	38,788	50,705
June	84,878	87.6	42,773	42,105
July*	52,066	53.7	16,741	35,325

*Two companies with a capacity of 785 tons per month on miscellaneous castings now out of business.

To Establish New Offices

Crane-Schiefer-Owens, Inc., will succeed the Crane Machinery Co., and will establish offices in Buffalo, Rochester and Syracuse on Sept. 4. Robert L. Crane, general manager of the Crane Machinery Co. and formerly western New York manager for Henry Prentiss & Co. for 23 years, will have charge of the home office in Buffalo. Frederick W. Schiefer, manager of Henry Prentiss & Co., Rochester, for the past nine years will have charge of the Rochester office, and Joseph F. Owens, sales manager of the Lapointe Machine Tool Co., Hudson, Mass., for 11 years will be in charge of the Syracuse office.

A voluntary petition in bankruptcy has been filed by the Maribel Straw Cutter Co., Maribel, Wis., organized two years ago to manufacture patented farm machinery. Schedules claim assets of $14,226 and admit liabilities of $4761.

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

THE twenty-sixth annual convention of the American Mining congress to be held in Milwaukee, Sept. 24 to 29, will bring together important and representative delegations from every state in the union to discuss the essential problems of the mining industry. A significant feature of this convention will be the discussions of the problems of the coal industry, particularly the problem of labor as it relates to industrial relations between the employer and the employe. A representative of the federal coal commission will be present to explain the viewpoint of the commission relative to the bituminous and anthracite coal industries and it is an interesting fact that the report of this commission relative to the soft coal industry, will be published on Sept. 22 only two days before the opening of the convention.

As a result, coal operators from all parts of the coal mining districts are planning to attend the meetings in Milwaukee in order to discuss and consider the problems of their industry and on Wednesday morning, Sept. 26, the third general session of the convention will be devoted entirely to a discussion of coal. Among the prominent men who will present their viewpoint at this session will be J. C. Bryden, president, of the National Coal association; Major Frank D. Rash, president of the St. Bernard Mining Co., in Kentucky; M. L. Gould, president of the Indiana Bituminous Coal Operators' association; J. G. Bradley, president of the West Virginia Coal Operators' association; and Albert J. Nason, president of the Illinois Coal & Coke Co., Chicago.

The industrial co-operation division of the American Mining congress is now organized and definite state committees are functioning in 23 different states. The conference in Milwaukee will bring together the representative leaders of the industry who have been co-operating in the development of a national policy in regard to industrial relations. Among the speeches which will have special significance will be those by Sidney J. Jennings, president of the American Mining congress; Lawrence F. Abbott, president of the Outlook Publishing Co., who will present the point of view of the public relative to the coal problems; James J. Davis, secretary of labor who will speak on the essential factors in the development of a permanent policy relative to the securing of permanent industrial peace in the mining industry.

In addition to the convention sessions, the National Exposition of Mines and mine equipment will bring together 150 models of the very latest types of mechanical equipment and machinery for mining industries and will emphasize the importance of the work of the standardization division of the American Mining congress and the necessity of a greater utilization of labor saving and cost reducing equipment and machinery in the expansion and development of the industry.

* * *

Announce Fall Meeting

Recent announcement has been made that the fall meeting of the Electric Power club will be held at the French Lick Springs hotel, French Lick, Ind. on Nov. 1922.

* * *

To Hold Exposition

Practically all of the foundries, shops and other metal working plants in North and South Carolina will be numbered among the exhibitors at the annual Made-inCarolina exposition which is to be held this year at Charlotte, N. C., Sept. 24 to Oct. 6.

* * *

To Expand Organization

At a meeting in Toronto of the directors of the Canadian National Safety league on Aug. 17, it was resolved that steps be taken immediately for the formation of leagues in the other Canadian provinces, the new organizations to be conducted along the same lines as the Ontario organization. The government recently has made a grant of $25,000 to the league.

* * *

Plan Winter Meetings

The board of directors of the Quad City Foundrymen's association held its first meeting after the summer recess at the Rock Island club, Rock Island, Ill., Aug. 22. A program for work during the coming year was outlined and it was agreed that the list of major subjects which should be given special attention should include pig iron, coke, industrial education, steel, cupola, molding sand, costs and malleable iron. Other subjects to be considered throughout the year as time permits are as follows: Piece rates, inspection, safety first, annealing, purchase of scrap, chilled work, green sand cores, electric furnaces, molding machines, sand handling machines, centrifugal process of molding, sand throwing machines. Thirty-one men prominent in the industry throughout the country have already promised to appear on the programs of the meetings of this society. The first meeting will be held Sept. 17.

* * *

Select Tentative Program

The tentative program of the fall meeting of the American Electrochemical society, to be held in Dayton, O., Sept. 27-29 has been announced. The technical sessions will be held at the Engineers' club and the headquarters of the society will be at the Miami hotel. The first session on Thursday morning will be devoted to the reading and discussion of papers pertaining to the symposium "Electrochemistry of Gaseous Conduction," with Dr. Duncan MacRae of the Westinghouse Lamp Co., Bloomfield, N. J. as chairman. Group lunch-

Convention Calendar

Aug. 20-30—American Institute of Mining and Metallurgical Engineers. Meeting at Quebec, Canada. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

Sept. 10-14—American Chemical society. Fall meeting, Milwaukee. L. Parsons, P. O. box 1515, Washington, is secretary.

Sept. 17—American Ceramic society. Fall meeting, Grand Central Palace, New York. R. C. Purdy, Ohio State university, Columbus, O., is secretary.

Sept. 17-22—Chemical Industries. National exposition, Grand Central Palace, New York.

Sept. 24-28—American Association of Iron and Steel Electrical Engineers. Convention and exhibition, Auditorium, Buffalo. Headquarters of the association are located at 1007 Empire building, Pittsburgh.

Sept. 27-29—American Electrochemical society. Annual meeting at Dayton, O. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Oct 1—National Safety council. Convention and exhibition, Hotel Statler, Buffalo. W. H. Cameron, 168 North Michigan avenue, Chicago, is secretary.

Oct. 8-12—American Society for Steel Treating. Annual convention at Pittsburgh, W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Oct. 24-26—National Association of Farm Equipment Manufacturers. Annual Meeting at Cleveland.

eons will be held Thursday noon and will be followed by discussions on the following subjects: "Electrical Furnace Brass Foundry Practice;" "The Development and Future of Electrodeposition;" "Organic Electrochemistry;" "Utilization of Chlorine." The technical sessions will be continued on Friday and Saturday.

* * *

Publish Program

Announcement has been made of the papers to be read at the technical sessions of the International Foundrymen's congress and exhibition to be held in Paris, Sept. 12-15. A group of papers in English, presented in behalf of the Institute of British Foundrymen and the American Foundrymen's association will be read on Thursday, Sept. 13. The papers to be presented are as follows:

A Study of Aluminum Bronzes, by M. Brizon, Etablissements Brizon, Courbevoie, Seine, and M. Galibourg, Chemist, Etablissements de Dion Bouton, Puteaux.

Making American Malleable Castings in Europe, by M. Gailly, Establ. Gailly, Charleville, Ardennes.

Methods of Testing Castings, by M. Ledesert, Compaignie de Fives Lille pour Constructions Mecaniques & Enterprises.

A Rational Method of Construction Patterns, by M. Le Bouteiller, engineer, 13 Rue de Billancourt, Paris.

The Devastation and Reconstruction of the Foundries in the Liberated Regions, by M. Lely, consulting engineer, Boulevard Flandrin, Paris.

Malleable Castings, by M. Pascal, engineer, Le Cambon-Feugerolles.

Electric Furnaces, by M. Perrin, manager, Ste d'Etudes Metallurgiques & d'Installations Industrielles, Paris.

Results from Mechanical Testing of Castings, by M. Seigle, Professor, Institute of Metallurgy & Mines, Nancy.

The Foundry Leader's Task, by M. Thomas, foundry manager, Etablissements Les Fils de A. Piat & Co., Soissons.

Metal for Machinery Castings, by M. Pisek, professor, Ecole Polytechnique Tcheque de Brno and president of the Association Technique de Czecho-Slovakia.

The Fatigue Limit of Cast Iron by Jaime Coll, lieutenant colonel, Spanish arm, Seville, Spain.

A Nomenclature for Foundrymen, by M. Lamourex, manager, *La Revue Belge de Fonderie*, Liege.

Standardizing Foundry Costs, by M. Masson, secretary, committee on costs, Belgian Foundrymen's association.

Report on Malleable Castings, Belgian Foundrymen's association, by M. Piedeboeuf, foundryman, Liege and M. Remy, foundryman, Herstal-lez-Liege.

Report of Committee on Apprenticeship, Belgian Foundrymen's association, by W. Varlet, manager, Establissements de'Esparance Longdoz, Liege.

The papers to be presented in English are as follows:

The Graphitization of Cast Iron, by C. Adamson, engineer, Sheffield.

The Necessity for Standardizing Molding Sands, by H. Holmes, Newcastle-on-Tyne.

General Arrangement and Maintenance of American Foundries, by H. M. Lane, H. M. Lane & Co., Detroit.

In addition to the papers listed above, the five additional papers furnished by the American Foundrymen's association and the Institute of British Foundrymen which will be presented are as follows:

Contributed by A. F. A.

"The Bonding Substance of Molding Sand; Its composition, Properties and Tests," by H. B. Hanley, foundry engineer, Arnett building, Rochester, N. Y. (Official exchange paper.)

"Testing Cast Iron," by Dr. Richard Moldenke, Watchung, N. J.

"The Use of Steel in Cast Iron Foundry Mixtures," by E. J. Lowry.

Contributed by I. B. F.

"Magnesium in Foundry Practice," by H. J. Meybury, chief metallurgist, Magnesium Co., Ltd., London.

"Cast Iron," by Oliver Smalley, foundry manager, Sir. W. G. Armstrong-Whitworth & Co., Ltd., Newcastle-on-Tyne.

Navy Ready To Scrap Warships

WASHINGTON, Aug. 28.—France finally having ratified the naval agreement entered into by representatives of the United States, Great Britain, Japan, France and Italy at the limitation-of-armaments conference held in Washintgon in the winter of 1921-22, the scrapping of warships as designated in the pact is about to begin. The retrenchment of the United States navy will mean the passing of between 25 and 30 ships and the putting of 400,000 or 500,000 tons of scrap metal upon the market.

The ships are divided into three classes—new construction in private shipyards, new construction in navy yards, and ships afloat. On the ways at government yards and in private yards are six battle cruisers and seven battleships, of the 43,000-ton class.

The central sales office already has asked the private yards to submit bids upon the battleships and battle cruisers, in various stages of completion, upon their ways. One is for the ships as they are, the yard to break them up and sell the scrap. The other method of bidding is for the yard to break up the ships but for the navy department to market the scrap. At the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., are one battleship and two battle cruisers. At the Fore River, Mass., yard of the Bethlehem Shipbuilding Corp. is one battleship. At the Camden, N. J., yard of the New York Shipbuilding Co., is a battleship, which probably will be used as a target.

On the ways of the New York and Philadelphia navy yard are two battleships each, and at the Mare Island, Cal., and Norfolk, Va., navy yard one battleship each. Most of these uncompleted battleships and cruisers will have to be cut up where they are. In these navy yards and private shipyards are piled many thousands of tons of steel, nearly all of it already fabricated, for the completion of these vessels.

In addition to these battleships and cruisers, which were designed to be the most powerful afloat and would have made the United States supreme on the seas, are 15 old battleships now afloat. Three probably will be utilized as targets. Two will not be scrapped until two battleships now under way are completed. If the three destined to be targets are not sunk they will be sold for scrap.

The 10 battleships and cruiser which are in an uncompleted state will aggregate 450,000 tons full load displacement. This includes the fabricated steel piled up in navy and private yards ready to be used. The old battleships slated for immediate destruction total to about 226,085 tons full-load displacement. This makes an aggregate of 656,000 tons.

The British experience in breaking up warships is that about one-third of the full-load displacement can be subtracted as including stores, ammunition, crew and the like. On this basis the amount of metal in the American ships is about 450,724 gross tons. This total will vary, according to the amount of armor and the number of guns removed. The British experience has been that 60 per cent of the metal is heavy steel scrap, 10 per cent light steel scrap, 5 per cent cast iron, 7½ per cent brass and bronze and 2½ per cent lead. The remaining 15 per cent is wood, rubbish, and the like. So on this computation there should be available 270,434 gross tons of heavy steel scrap, 45,072 tons of light steel scrap, 22,536 tons of cast iron, 33,804 tons of brass and bronze and 11,268 tons of lead.

These figures are approximate. The last sale of obsolete battleships by the navy department resulted in the Dravo Contracting Co., of Pittsburgh, taking the OHIO for $112,500 and the KENTUCKY for $103,500. This was last April. Since the displacement of the OHIO was 13,500 tons and of the KENTUCKY 12,23,0, the purchase price was approximately $12.50 per ton of metal.

The terms of sale are to be embraced in an announcement to be made in a few days offering the battleships now afloat for sale. They are to be offered as a scrap proposition wholly, the bidder to tow the ships to their own yards and break them up. It will be a few weeks before the private yards have put in their offers, if any, for breaking up the ships and for the metal in them. At this time the navy department's offer will be of fabricated steel for scrap purposes and ships for breaking up. Not until later will unfabricated sheets, plates and bars be marketed.

Steel Exports and Imports Fall

July Exports of Iron and Steel Make Only a Small Decrease while Imports Slump Sharply—Shipments from United States Total 171,142 Gross Tons as Compared with 176,403 Tons in June

FOR the second consecutive month both exports and imports of iron and steel products in July declined, according to the monthly commerce figures which have just been released by the United States department of commerce, bureau of foreign and domestic commerce. Although the drop in imports was heavy, the decrease in exports was slight. Exports in July aggregated 171,142 gross tons, a loss of but 5261 tons, or 2.98 per cent, from the 176,403 tons shipped from this country in June. Imports, however, totaled 53,451 gross tons, as compared with 67,968 tons during the preceding month, the loss being 14,517 tons or 21.4 per cent.

As compared with exports in July one year ago when the total was 161,204 tons, the July, 1923, total was a gain of 9938 tons. Imports in July, 1923, were less than the 56,425 tons of a year ago by 4505 tons.

For the seven months ending with July, 1923, exports totaled 1,169,793 tons. During the corresponding period of 1922 when shipments from this country totaled 1,329,479 tons this year's total shows a loss of 159,686 tons. Imports during the first seven months of 1923 totaled 568,858 tons which was a gain of 393,019 tons over the 175,839 tons shipped into the United States during the corresponding period of 1922.

During July gains in exports were made in pig iron, scrap, steel bars, alloy steel bars, boiler plate, hoops, bands and scroll, tin and terne plate, fabricated structural shapes, rails under 50 pounds, rail joints, etc., railroad spikes, railroad bolts, nuts, etc., boiler tubes, casing and oil line pipe, welded galvanized pipe, malleable iron fittings, cast iron pipe fittings, woven wire fencing, wire cloth and screening, insulated wire and cable, miscellaneous wire and nails. Many of these increases, however, were small. In galvanized sheets, miscellaneous structural forms, metal lath and switches, frogs, etc. only small decreases were noted. Appreciable losses were shown in semifinished iron bars, wire rods, plates, black steel sheets, black iron sheets, plain structural shapes, rails under 50 pounds, welded black pipe, cast iron pipe, plain wire, galvanized wire, barbed wire, wire nails and bolts, nuts, rivets, etc.

Pig iron exported in July totaled 2966 tons, this being a loss of only six tons from the 2960 tons shipped during June. In July a year ago, the pig iron exports totaled 1943 tons. Shipments for the first seven months of this year aggregated 17,811 tons as against 15,773 tons during the same period of 1922.

Rails exported in July totaled 24,521 tons as against 18,937 tons in June, the increase being 5584 tons. For the first seven months rail exports totaled 142,332 tons as against 184,355 tons during the corresponding period of 1922. Exports of galvanized iron in

IMPORTS AND EXPORTS

Gross Tons

	1923		1922	
	Imports	Exports	Imports	Exports
Jan.	119,955	135,046	13,404	165,962
Feb.	67,682	136,853	11,535	133,333
March	106,050	168,176	12,774	206,474
April	77,794	183,905	18,720	197,562
May	75,840	195,535	23,098	229,616
June	67,968	176,403	39,154	216,298
July	53,451	171,142	56,425	161,204
Aug.	.....	.....	49,054	144,264
Sept.	.....	.....	76,393	128,370
Oct.	.....	.....	184,202	131,542
Nov.	.....	.....	152,250	124,004
Dec.	.....	.....	96,358	154,087
Total	568,740	1,167,060	733,367	1,992,716

Year	Imports	Exports
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IRON AND STEEL EXPORTS

Gross Tons

	July		Seven months ending July	
	1923	1922	1923	1922
Pig iron	2,966	1,943	17,811	15,773
Scrap	4,598	3,938	25,871	49,357
*Semifinished	6,476	10,145	69,918	67,017
Iron bars	717		9,918	
Steel bars	14,530	13,435	98,500	124,988
Alloy steel bars	635		1,549	
Wire rods	1,878	1,844	18,127	34,135
Boiler plate	1,025	827	5,296	10,863
Other plates	7,574	6,104	69,971	54,593
Galvanized sheets	9,453	9,245	76,949	73,312
Black sheets, steel	7,472	12,829	63,407	182,370
Black sheets, iron	1,275	924	8,876	7,562
Cold-rolled strips	696	549	7,790	2,819
Hoops, bands and scroll	2,001	2,688	15,600	17,305
Tin and terne plate	13,029	4,038	65,336	49,453
Structural shapes, plain	10,861	5,549	76,861	29,107
Structural shapes, fabricated	2,908	1,927	17,843	12,198
Ship and tank plates, punched and shaped	393	33	2,014	1,261
Other structural forms	3,714	4,389	22,495	42,346
Metal lath	101	**	678	**
Rails over 50 pounds	23,463	28,598	127,926	166,252
Rails under 50 pounds	1,058	1,313	14,406	18,103
Rail joints, etc.	3,019	2,242	13,553	12,857
Switches, frogs, etc.	429	441	2,685	3,319
Railr'd spikes	1,088	601	5,200	4,456
Railroad bolts, nuts, etc.	301	223	1,415	1,368
Boiler tubes	1,662	1,325	9,400	6,553
Casing and oil line pipe	5,008	3,028	32,205	29,500
Welded black pipe	6,694	3,937	46,344	46,681
Welded galvanized pipe	3,306	2,881	16,384	18,394
Malleable iron pipe fittings	1,002	713	4,274	4,774
Cast iron pipe	1,273	2,446	8,512	12,872
Cast iron pipe fittings	1,044	502	6,898	4,563
Plain wire	3,184	3,868	22,143	21,829
Galvanized wire	3,934	5,660	35,373	56,565
Barbed wire	7,731	10,037	47,197	40,618
Woven wire fencing	653	212	2,682	1,568
Wire cloth and screening	188	154	863	776
Wire rope	550	620	4,038	2,601
Insulated wire and cable	100	41	894	552
Other wire	1,474	1,757	8,776	10,066
Cut nails	33	412	1,657	2,580
Wire nails	3,781	2,882	22,871	42,161
Horsesnoe nails	106	54	747	413
Other nails	481	293	2,952	2,415
Bolts, nuts, rivets, etc.	1,599	1,736	11,052	10,534
Horseshoes	83	145	547	485
Other iron and steel	5,510	4,497	40,186	31,008
Ferromanganese and spiegeleisen	4	179	3,220	908
Ferrosilicon	82	.....	573	249
Total	171,142	161,204	1,169,793	1,329,479

*Includes ingots, blooms, billets, slabs and skelp, sheet and tin plate bars.

**Due to reclassification comparisons are not possible.

CASTINGS AND FORGINGS EXPORTS

Gross Tons

	July		Seven months ending July	
	1923	1922	1923	1922
Iron castings	1,001	750	6,035	5,983
Steel castings	426	107	2,829	1,191
Car wheels and axles	2,815	1,524	11,465	10,454
Iron and steel forgings	246	239	1,867	1,667
Total	4,488	2,620	22,196	19,295

FERROALLOY EXPORTS

Gross Tons

	July		Seven months ending July	
	1923	1922	1923	1922
Ferrosilicon	82	.....	573	249
Ferromanganese & spiegeleisen	4	179	3,220	908
Tungsten, manganese and other ores	233	.....	673	.....
Ferrotungsten, tungsten metal and wire	125	.....	2,227	303
Ferrovanadium	....	3	10	18
Other ferroalloys	2	.....	381	483

July were 9452 tons as against 10,664 tons during the preceding month. For the seven months ending July, 1923, exports of this product totaled 76,949 tons, as compared with 73,312 tons during the same period of 1922. Tin and terne plate exports were 13,029 tons, as against 6966 tons during July, 1922.

Imports of iron and steel in July were the lowest since August, 1922, when the tonnage shipped into this country

PIG IRON IMPORTS
Gross Tons

From:	
Belgium	3,524
France	1,804
Germany	750
Sweden	51
England	9,554
Scotland	2,400
Quebec-Ontario	1,224
British Columbia	38
British India	215
China	200
Total	19,760

IRON ORE IMPORTS
Gross Tons

From:	—July—		Seven months Ending July	
	1923	1922	1923	1922
Spain	56,291	4,891	184,000	20,869
Sweden	145,508	54,878	546,559	124,648
Canada	9,472	367	23,010	1,321
Cuba	96,500	56,275	430,351	133,572
Other countries	131,596	50,300	583,938	93,407
Total	439,367	166,711	1,767,858	374,407

was 49,054 tons. Decreases were noted in practically every product during July. Pig iron imports decreased from 30,033 tons in June to 19,760 tons in July, scrap from 15,717 to 14,216 tons, bar iron from 1365 to 760 tons, rails from 4244 to 1127 tons, tin plate from 124 to 92 tons and wire rods from 502 to 138 tons. Steel ingots, bars, etc., increased from 736 tons in June to 1098 tons in July and structural shapes from 720 to 292 tons. Ferromanganese

IRON AND STEEL IMPORTS
Gross tons

	—July—		Seven months ending July	
	1923	1922	1923	1922
Pig iron	19,760	18,828	313,900	45,227
Ferromanganese	11,314	18,041	58,049	45,334
Ferrosilicon	1,068	2,300	8,423	7,076
Scrap	14,216	9,611	130,862	38,778
Bar iron	760	2,113	5,063	3,290
Steel ingots, bars, etc.	1,098	882	9,044	11,032
Structural shapes	2,092	136	6,074	1,244
Rails	1,127	4,077	15,651	20,435
Boiler and other plates	1	156	484	329
Sheets and saw plates	244	.....	953	.....
Tin plate	92	37	9,470	2,120
Wire rods	148	244	2,136	974
Total	51,920	56,425	560,109	175,839

OTHER IMPORTS
Gross tons

Tubular products	529	*	2,742	*
Round iron and steel wire	312	*	2,550	*
Casting and forgings	388	*	1,797	*
Nails and screws	72	*	776	*
Bolts, nuts, rivets, etc.	6	*	128	*
Flat wire and strip steel	224	*	756	*
Grand total	53,451		568,858	

*Due to changes in classifications, comparisons are not possible.

and ferrosilicon shipments into the United States were practically the same as during June.

During the first seven months of 1923 imports of pig iron totaled 313,900 tons as against 45,237 tons during the corresponding period of 1922. For the same period scrap imports totaled 130,862 tons as against 38,778 tons.

Of the 19,760 tons of pig iron imported in July, Belgium supplied 3524 tons; France, 1804; Germany, 750; Sweden, 51; England, 9554; Scotland, 2400; Canada, 1262; British India, 215; and China 200 tons.

The valuation of iron and steel exports during July was $21,582,626, as compared with $21,242,193 tons in June and $14,604,923 in July, 1922. For the first seven months of 1923 the valuation was $133,023,424, as against $115,060,935 for the corresponding period of 1922.

Expect Large Shipments from New Mexico

Washington, Aug. 28.—Shipments of fluorspar and manganese from New Mexico in the last half of this year promise to be large, the federal geological survey states, but no statistics

FERROMANGANESE AND MANGANESE ORE IMPORTS
Gross Tons

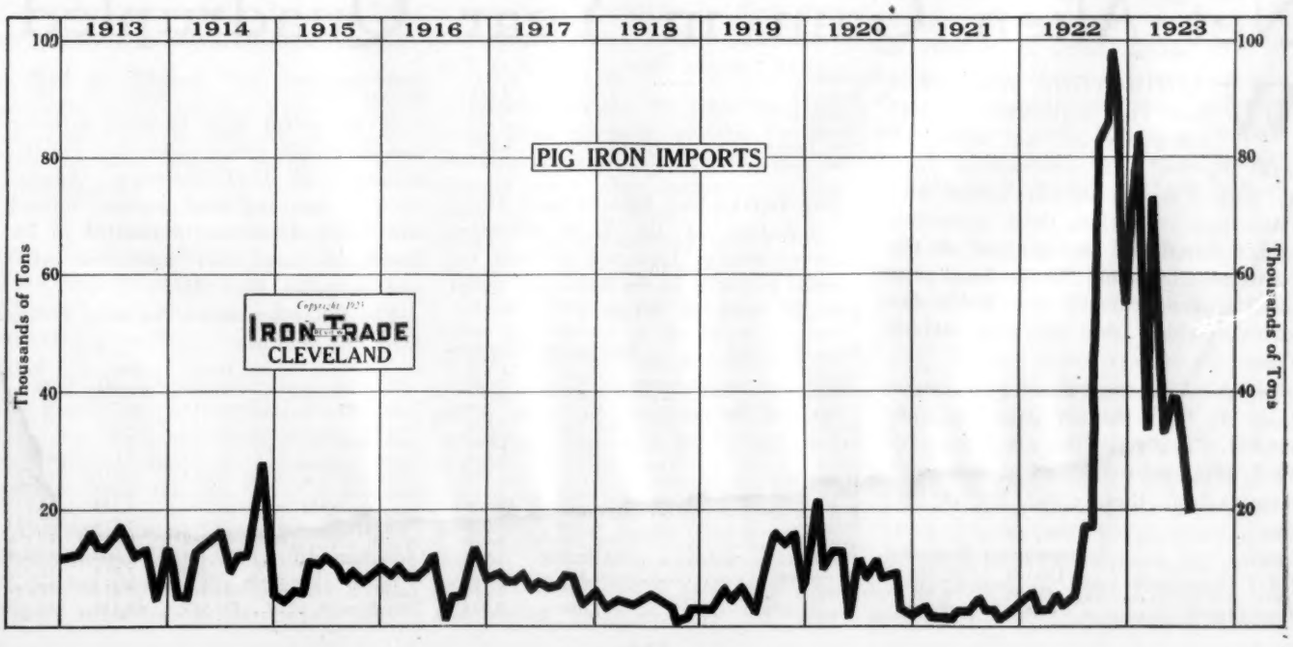
Manganese ore from:	July, 1923
Russia-in-Europe	2,225
Argentina	928
Brazil	17,549
British India	3,102
Hongkong	20
Total	23,824
Ferromanganese from:	
France	17
Germany	4
England	11,245
Quebec-Ontario	48
Total	11,314

IMPORTS OF VARIOUS ORES AND FERROALLOYS
Gross Tons

	—July—		Seven months ending July	
	1923	1922	1923	1922
Ferromanganese	11,314	18,041	58,049	45,334
Ferrosilicon	1,068	2,300	8,423	7,076
Manganese ore	23,824	70,318	104,212	218,547
Tungsten bearing ore	.....	.....	.....	.....
Nickel ore	808	.....	4,355	.....

are given. The total value of New Mexico's metal mine output in 1922 was $5,898,446, compared with $2,651,145 in 1921. The greatest year in New Mexico was 1917, when the metal mine output reached $34,896,963, the survey states.

The Modern Brass Foundry Co., Inc., Indianapolis, Ind., filed suit in voluntary bankruptcy in federal court recently listing liabilities at $14,763.66 and assets at $4,648.11.



Iron and Steel Payrolls Lower

Average in July $116 Compared with $129.92 in June and $133 in May—Decrease of 3 Per Cent in Employment from June Figures Noted—Outlay and Numbers Still Far Above 1922

WASHINGTON, Aug. 28.—Iron and steel works employes in the United States averaged $116.02 in their pay envelopes in July, compared with $129.98 in June and $133.08 in May, according to the bureau of labor statistics. But when the July average of $116.02 is set up against the $83.26 of July, 1922, and the $76.96 of July, 1921, the comparison is more favorable.

One hundred and seventy-six plants reported for both June and July. In July they were employing 255,479 men, against 232,562 in June, a decrease of 3 per cent in July. The aggregate of payrolls in July for a one-week period was $6,037,143 and for June $6,994,531, a recession of 13.7 per cent. However, if we compare the month of July this year with July last year the increase for this July in volume of employment was 14.4 per cent and the increase in aggregate of payrolls 54.3 per cent.

In July, employment in agricultural implement plants decreased 7.3 per cent while payrolls receded 8.6 per cent. In automobile plants employment in July went down 3.1 per cent and payrolls 2.6 per cent. Foundries and machine shops reported a gain of 0.5 per cent in employment but a loss of 1 7 per cent in payrolls. Steel shipbuilding yards went back 3.5 per cent in personnel and 10.8 per cent in payrolls.

Comparing July with June, per capita earnings decreased 2.8 per cent in car building and repairing shops, 7.5 per cent in the iron and steel industry, 3.5 per cent in machine tool works, 9.5 per cent in steel shipbuilding plants, 11 per cent in stove works and 5.1 per cent in hardware concerns. They increased 1.2 per cent in structural ironwork plants and 0.6 per cent in automobile factories.

Of the agricultural implement plants reporting for July, 83 per cent were operating full time. In the iron and steel industry the percentage of plants operating full-time in July was 64, in hardware 97, in steel shipbuilding 96, in stoves 56, in foundries and machine shops 92 and in automobiles 85.

Average Monthly Wages in Iron and Steel Industry, and Number of Employes

	Number of establishments	Number of employes	Payroll for half month	Average wage per month	Average wage year previous
July	176	225,479	$13,080,477	$116.02	$83.26
June	166	216,264	14,057,037	129.98	94.58
May	175	241,351	16,080,907	133.08	93.52
April	182	218,591	13,062,933	119.52	88.14
March	189	241,068	14,885,085	123.52	89.02
February	187	223,615	13,668,599	122.24	85.58
January	184	217,303	13,032,701	119.42	78.70
December, 1922	133	195,602	11,860,426	121.06	89.32
November	132	185,488	11,036,241	118.90	92.68
October	140	176,387	9,903,466	112.28	81.80
September	126	164,731	8,858,008	108.02	77.40
August	125	153,260	7,424,212	97.04	84.88
July	110	142,721	5,941,489	83.26	76.96
June	110	146,087	6,906,566	94.58	87.82
May	106	136,593	6,383,730	93.52	97.64
April	108	125,089	5,509,555	88.14	106.33
March	113	120,663	5,341,971	89.02	122.18
February	108	119,463	5,306,863	85.58	129.70
January	106	103,056	4,055,652	78.70	150.16
Averages:					
1922	118	147,882	7,378,535	98.78	.....
1921	114	117,223	5,869,438	100.12	.....
1920	105	172,318	13,015,883	151.06	.....
1919	105	154,244	9,989,098	128.22	.....
1918	97	180,859	10,734,114	118.74	.....
1917	97	180,088	8,327,492	92.49	.....

Net Alien Gain in Year Quadrupled

WASHINGTON, Aug. 28.—New York state was the chief beneficiary of the inflow of aliens in the fiscal year ended June 30, with Texas a distant second and Massachusetts a close third, according to the bureau of immigration of the department of labor. In the fiscal year 522,919 aliens entered and 81,450 departed, making the net gain 441,469 aliens.

In the preceding fiscal year, ended June 30, 1922, the net gain was only 110,844. The states to which most of the 1923 aliens went, and also the departures from these states, are as follows:

State	Immigrants	Emigrants
New York	130,142	32,228
Texas	45,198	1,325
Massachusetts	41,602	7,300
California	390,93	7,524
Michigan	37,034	2,413
Pennsylvania	36,834	6,316
Illinois	35,612	4,582
New Jersey	25,274	3,288
Ohio	17,455	2,725

The arrivals and departures of aliens by seventeen of the more important races or peoples from and to their respective countries in the fiscal year ended June 30 were as follows:

Race of people	Immigrants	Emigrants
African	7,554	1,525
Chinese	4,074	3,788
Croats and Slovenes	4,163	233
English	60,524	7,979
French	34,371	1,896
German	65,543	2,217
Hebrews	49,719	413
Irish	30,386	1,511
Italians	48,280	23,567
Magyars	6,922	1,039
Mexican	62,709	2,479
Polish	13,210	5,278
Rumanian	1,397	1,098
Russian	4,346	1,611
Scandinavians	37,630	2,936
Scotch	38,627	1,129
Slovaks	6,230	387

In the fiscal year laborers arriving totaled 83,552, offset somewhat by the departure of 32,912 laborers. Admissions of iron and steel workers totaled 4076 while departures amounted to 75. Incoming machinists numbered 4418 and outgoing ones 351.

The following shows the alien movement by months:

	Immigrants	Emigrants	Net gain
July, 1922	41,241	14,738	26,503
August	42,735	10,448	32,287
September	49,881	7,527	42,354
October	54,129	7,192	46,937
Novemoer	49,814	7,077	42,737
December	33,932	8,157	25,775
January, 1923	27,773	4,232	24,541
February	29,927	2,794	27,133
March	42,888	3,610	39,278
April	52,433	4,509	47,924
May	,809	5,752	47,057
June	44,166	5,414	38,752
Fiscal year	522,919	81,450	441,469

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

J LEONARD REPLOGLE has resigned as active president and chairman of the executive committee of the Vanadium Corp., of America, due to ill health. He retains his large holdings in the corporation and continues as a director. Mr. Replogle recently was elected a director of the Brightman Mfg. Co., Columbus, O. Pending the selection of his successor, the presidency of the Vanadium corporation will be assumed by Col. Merrill G. Baker, at present vice president of the company.

During the war Mr. Replogle was director of steel supplies of the war industries board of the council of defense. During the early days of the war he acquired options covering control of the Cambria works and sold the property to the Midvale Steel & Ordnace Co. when that company was formed. Since that time he has been a prominent figure in iron and steel circles.

James S. Curren has retired from the American Steel Products Co., Providence, R. I., and the business will be continued by Sinius J. Nelson.

J. A. Campbell, president of the Youngstown Sheet & Tube Co. will spend a week in the East on a combined business and vacation trip.

J. F. Hinterleiter has been appointed manager of the coal department of the Debevoise-Anderson Co., Inc., 114 Liberty street, New York, effective Aug. 20.

Olaf E. Oleson has resigned as president of the Edward Valve & Mfg. Co., East Chicago, Ind. W. W. Crawford has been elected to fill the position vacated.

L. W. Seeligsberg, formerly affiliated with the McGraw-Hill Co., Inc., New York, has established an office at 50 Church street, that city, for industrial advertising service.

Cyrus A. Birge, vice president of the Steel Co., of Canada, Hamilton, Ont., has been appointed president of the Bank of Hamilton succeeding the late Sir John Hendrie.

Paul McAllister, formerly with the Westinghouse Lamp Co., Bloomfield, N. J., has assumed the duties as metallurgical engineer with the Western Electric Co., at its Hawthorne Works, Chicago.

Dr. Ralph H. McKee, professor of chemical engineering at Columbia University, has recently developed a method of manufacturing Dr. M. Kahn's intarvin, a new remedy for diabetes, on a large scale.

W. S. Singer manager of the Steubenville plant of the Wierton Steel Co. has resigned from that organization. He had been connected with the plant for 11 years. J. R. Black, for many years the general inspector of the company will succeed Mr. Singer.

James R. Kimball recently was elected president of the reorganized F. W. Mann Co., Inc., Milford, Mass., manufacturer of automobile jacks, etc. L. M. Vesey was chosen vice president, Philip S. Kimball, treasurer, and Walter B. McFarland, secretary.

T. H. Harvey, works manager of the Ohio Steel Foundry Co., Springfield, O., returned recently from a tour of the United States on business for his concern. He reports that his company is booked ahead for 90 days.

Eugene L. Beisel, formerly connected with the Reeve-Fritts Co., Chicago has become associated with Charles H. Besly & Co., Chicago, and will represent the company in New York and Pennsylvania. His headquarters will be at 79 Norwalk avenue, Buffalo.

Horace C. Finkle, for seven years secretary and treasurer of the Portland Foundry Co., Inc., Portland, Conn., has resigned from that company to represent in Detroit, Mich., the W. & B. Douglas Co., a subsidiary of the Premier Mfg. Co., Middletown, Conn.

George Wagner, former head of the police department of the Berwick plant of the American Car & Foundry Co. recently was made special iron and coal police chief of operations at Lattimer and Milnesville, Pa. of the Pardee Bros. & Co.

James B. Bailey, president, Pine Ironworks Co., Pine Forge, Pa., is visiting Europe. Mr. Bailey expects especially to study semifinished steel producing and market conditions on the Continent. He probably will return to the United States late in August or early in September.

H. R. Stuyvesant, for the past four years associated with the Alabama Co. in the capacity of general superintendent of blast furnaces has resigned from that company as of Oct. 1 Mr. Stuyvesant concontemplates entering the blast furnace business again in another capacity after Jan. 1.

Dr. L. H. Baekeland, past president of the American Electrochemical society, recently has been made "Officier de la Lagion d'Honneur" by the French government. Dr. W. D. Bancroft, also a past president of the society, received the degree of Doctor of Science from the University of Cambridge, England, during his recent trip abroad.

K. Engelsted, representative of the Soderfors Steel Co., Sweden, manufacturer of special and commerical steels has returned from an extended trip through Scandinavia. He states that the long lockout which existed in Sweden and which was settled a day or two before he returned to this country will not be as disastrous as some consumers fear.

J. P. Moses has recently been appointed general manager of railroad sales for Joseph T. Ryerson & Son, Inc., at Chicago. He succeeeds H. A. Gray, who has resigned to enter another field of business. Mr. Moses has been with the Ryerson company for more than 22 years and is well known in railway circles. For years he has specialized in high grade refined iron for railroad use.

T. W. Herron, Los Angeles, recently elected president of Harron, Rickard & McCone succeeds H. G. Mitchell, who resigned a short time ago. A. B. Todd, former sales manager for the company at Los Angeles was appointed branch manager in the place of Mr. Harron, and F. C. Edmonds, San Francisco, branch manager was appointed sales manager.

Pete Craciun will be transferred as of Sept. 1 from the Alliance, O., works of the American Steel Foundries Co. and will enter the main offices in Chi-

cago as general payroll auditor. He will supervise the auditing of the monthly payrolls of the various plants of the company. He succeeds E. P. Medlan, who is leaving the American company. Russell E. Reese will occupy the position vacated by Mr. Craciun in his change.

George Roberts, proprietor of the Thistle Wire Works, Lee, Mass., who passed the summer at his old home in Scotland, sailed for America Aug. 25.

Joseph F. Owens, in charge of the Syracuse office of the Crane-Schiefer-Owens, Inc., was for the past 11 years sales manager of the Lapointe Machine Tool Co.

C. B. Wheeler of the Dayton Metal Products Co., Dayton, O., has succeeded I. W. Pettengill as general manager of the Cincinnati Screw Co. Mr Pettengill has become secretary and general manager of the Cincinnati, Milford & Blanchester Railway Co.

Frederick W. Schiefer, in charge of the Rochester office of the Crane-Schiefer-Owens, Inc., was for the past nine years manager at Rochester for the Henry Prentiss & Co.

Raymond P. Van Camp, formerly vice president of the Van Camp Hardware & Iron Co., Indianapolis, was elected president of that company recently to fill the position vacated by the death of Cortland Van Camp.

Robert L. Crane, for 23 years western New York manager for Henry Prentiss & Co., and general manager of the Crane Machinery Co. will have charge of the home office at Buffalo of the Crane-Schiefer-Owens, Inc., successors to the Crane Machinery Co.

E. F. Boyle, Monadnock building, San Francisco, has been appointed Pacific coast representative of the Grip Nut Co., Chicago, and J. L. Stephenson, Munsey building, Washington, has been appointed representative for the company on certain railroads.

Dr. Siegfried G. Werner, president of the German foundrymen's association, Dusseldorf, has been arrested on a political charge by the army of occupation. Dr. Werner was for some years connected with the Newburgh works of the American Steel and Wire Co., Cleveland.

Graham Bright, formerly engineer in charge of the coal and metal mining activities of the Westinghouse Electric & Mfg. Co. has joined the firm of Howard N. Eavenson & Associates, mining engineers, Pittsburgh. Mr. Bright joined the Westinghouse company in 1898, shortly after he was graduated from the University of Pittsburgh. Mr. Bright is active in mining and metallurgical fields and is chairman of the mining committee of the American Institute of Electrical Engineers, chairman of the committee on underground locomotive standardization of the American Engineering Standards committee representing the American Institute of Mining and Metallurgical Engineers, and a member of its mining correlating committee.

J. H. Kempster former superintendent of mill No. 6 of the Universal Portland Cement Co. has been appointed general superintendent of the Buffington plant of that company, Buffington, Ind. The plant consists of mills No. 3, 4 and 6. Mr. Kempster entered the Universal Portland company in 1907 as chemist of plant No. 2, South Chicago.

George C. Whittaker was recently appointed by the Cleveland Crane & Engineering Co. as manager in charge of sales of the tramrail division in the Philadelphia district, with offices at 2401 Chestnut street. George P. Morse was appointed by the company as Brooklyn and Long Island distributor for the same division, with headquarters at 110 William street, New York.

Bernard Minn, 1409 Fifteenth street, Milwaukee, has been elected president of the Safety Highway Engineering Co., recently incorporated in Wisconsin with $1,000,000 capital to manufacture and market a line of automatic safety signals, traffic regulating poles and other devices protected by American and Canadian patents. Plans are being made to equip a plant. H. C. Hoppman is vice president, and W. A. Richter, secretary and treasurer of the new company.

M. E. Nolan, formerly pig iron sales agent at Pittsburgh for the Cambria Steel Co., Johnstown, Pa., now is Pittsburgh district manager for Agnew, Batteiger & Co., Inc. Philadelphia, which has established a Pittsburgh office at 1601 Oliver building. Mr. Nolan was associated with the Cambria company for about seven years, both at Philadelphia and Pittsburgh. In his new affiliation he will sell pig iron, coal, coke, ferroalloys, ores and scrap.

Bart L. Thane, well known mining engineer, formerly an official of the Alaska Gastineau Mining Co., Thane, Alaska, has returned after a four months trip in the Orient. He is accompanied by G. Ishikawa and Mosaku Ohta, Japanese mining engineers, who will accompany him to Alaska to look over mining property near Juneau. Four years ago Mr. Thane proposed to establish a rolling mill at Seattle. Due to conditions following the war he was unable to carry out his plans.

George F. Moore, for the last 36 years connected with the Cambria Iron Works, has severed his affiliation with that company and has bought the control of the Real Estate Exchange, Johnstown, N. Y. Mr. Moore began working for the Cambria company in 1887 under the late Alexander Hamilton of the rolling mill. He went from the rolling mill to the shipping department and then to the auditing division. Since 1900 he has served as paymaster for the Cambria works, acting in that capacity until the recent purchase of the plant by the Bethlehem Steel Co. Mr. Moore's new location is in the United States Bank building, Franklin street, Johnstown, N. Y.

July Automobile Output Drops 14 Per Cent

The production of automobiles in July shows a decrease of 14 per cent from June, according to figures issued by the department of commerce. Total production of 327,102 passenger cars and trucks compares with 377,759 in June, a decrease of 50,657. Production of passenger cars totaled 297,104, compared with 337,143 in June, a decrease of 40,039 or nearly 12 per cent. Production of trucks fell off 23 per cent, totaling 29,998 in July, compared with 40,616 in June, a decrease of 10,618. Compared with July, 1922, passenger car production was 32 per cent higher, while truck production showed an increase of about 38 per cent. The figures cover approximately 90 passenger and 80 truck manufacturers. Monthly totals and comparisons with 1922 follow:

PASSENGER CARS

	1923	1922	Increase
July	297,104	224,770	72,334
June	337,143	263,027	74,116
May	350,180	232,431	117,749
April	344,474	197,216	147,258
March	319,638	152,959	166,679
February	254,650	109,171	145,479
January	223,706	81,693	142,013

TRUCKS

July	29,988	21,837	8,161
June	40,616	25,984	14,632
May	43,013	23,788	19,225
April	37,527	22,342	15,185
March	34,681	19,761	14,920
February	21,817	13,195	8,622
January	19,938	9,416	9,982

Transue Earnings Gain

July earnings of the Transue & Williams Steel Forgings Corp., amounted to $29,679 after expenses and taxes. This compared with $48,426 in June. For the seven months ended July 31, net earnings were reported at $308,728 against $101,163 for the corresponding period of 1922.

The Buick Motor Car Co., Flint, Mich., announces its new production schedule for the year beginning Aug. 1 at 225,000 cars, an increase of 45,000 over the previous years.

Obituaries

WALDO H. MARSHALL, chairman of the Consolidated Machine Tool Corp. of America, and formerly president of the American Locomotive Co. died at his summer home at Barnstable, Mass., Aug. 23, at the age of 59. His death was due to an attack of appendicitis following an illness of but a few days.

Mr. Marshall was born in East Boston, June 7, 1864, and began his connections with the metal industry with the Rhode Island Locomotive Works where he served an apprenticeship. He later entered the drafting room where he soon became chief draftsman. For a short time he was located in New York as a consulting mechanical engineer from which position he went to Chicago in 1888 as editor of the *Railway Review*. Three years later he became editor of the *Railway Master Mechanic* and in 1896 and 1897 he edited the *American Engineer and Railroad Journal* with Mr. M. N. Forney.

From his editorial duties Mr. Marshall went to the Chicago & Northwestern railroad in 1897 on the receipt of an appointment as assistant superintendent of motive power. Two years later he went to the Lake Shore & Michigan Southern railway as superintendent of motive power and for a year and a half in 1902 and 1903 he was general superintendent of that road along with the Lake Erie & Western, and Indiana, Illinois & Iowa. He resigned from these connections in 1906 to become president of the American Locomotive Co., a position he occupied for 11 years. He became chairman of the Consolidated Machine Tool Corp. of America in the spring of 1923, succeeding C. K. Lassiter who died March 3, with whom he helped organize the Consolidated corporation as a merger of five companies.

In addition to his railroad activities and connections with the American Locomotive Co. and Consolidated Tool Corp. of America, Mr. Marshall was a director of the American Brake Shoe & Foundry Co. and the Bucyrus Co. In 1917 he was affiliated with J. P. Morgan & Co. During the late war he was chief of the production division of the ordnance department, an appointment he received from the government in January, 1918.

Mr. Marshall was a member of the American Society of Mechanical Engineers. No one has been appointed as yet to succeed him as head of the Consolidated corporation.

Robert W. Hallam, superintendent of the Meriden Cutlery Co., Meriden, Conn., for the past 15 years and connected with it for 50 years, died at his home in that city, Aug. 21, at the age of 83 years.

Frank A. Doepke, who founded the Doepke Metal Pattern Works, 1108 Layton boulevard, Milwaukee, in 1907, died Aug. 20 after an illness of a year's duration. He was 59 years of age.

William Claxton Bray, treasurer of the Tubular Rivet & Stud Co., Boston, of which his father, the late Mellen Bray, was president, died at his home in Newton Center, Mass., Aug. 19.

William H. Garner, for many years identified with the Canton Art Metal Co., Canton, O., and the J. H. Edler Mfg. Co., also of Canton, died at his home in that city recently at the age of 47 years.

William E. Curtis, 68 years old, a director of the Scovill Mfg. Co., Waterbury, Conn., died unexpectedly at his summer home at York Harbor, Me., Aug. 20. He was assistant secretary of the treasury under the second Cleveland administration.

Milton B. Hill, president of the M. B. Hill Mfg. Co., Worcester, Mass., machinist, died unexpectedly at his home in that city, Aug. 24. He was 72 years old, had been a successful inventor and was for many years employed by the Norton Co., Worcester.

Frank Wheeler, founder of the firm of Frank Wheeler & Son, Meriden, Conn. builder of power presses, died at his summer home in Stony Creek, Conn., Aug. 21. He was in his eighty-eighth year. His only son, A. E. Wheeler, will continue the business.

Faustin Prinz, president and treasurer of the Prinz & Rau. Mfg. Co., Milwaukee, died recently following a protracted illness, at the age of 72. He was well-known as an inventor and manufacturer of milling machinery. Mr. Prinz came to this country from Austria in 1880. He first served as a millwright and a few years later organized the company of which he was president.

Daniel Bast, founder of the Best Mfg. Co., and well known as a manufacturer of military tractors, died Aug. 22 at his home in San Leandro, Ore., at the age of 85. Mr. Best crossed the plains in 1859 settling in Oregon in 1866, at which time he founded the Best company. During the war his company was prominent in the manufacture of tractors adopted by the military authorities for tank service.

George L. Harvey, architect, author and inventor, the designer of the first steel railway car and inventor of a friction spring bearing his name, died at the Presbyterian hospital, Chicago, Aug. 13. Mr. Harvey was best known as an architect, having designed many well-known structures among which were the Field Estate building, Chicago, the Gary hospital of the United States Steel Corp., and the Oak Park hospital, Oak Park, Ill. His friction spring is now in use by more than three-fourths of the railroads of the country.

William Willams, manager of the Interstate Iron & Steel Co., East Chicago plant, died suddenly of heart failure on the morning of Aug. 20. He was born Oct. 30, 1878 and had been connected with the iron and steel industry for the last 25 years. Starting in as clerk of the Republic Iron & Steel Co., at Sharon, Pa. he went successively to the Chicago office and then to the East Chicago works. In 1904 he was transferred to the Fort Wayne Rolling mills at Fort Wayne, Ind. and shortly after entered the service of the Interstate Iron & Steel Co., where for 14 years he has been associated with the East Chicago plant, first as head of the order department, later as assistant works manager and for three years as works manager. Burial will be at his old home at Sharon, Pa.

Lake Superior Net Up

The Lake Superior Corp. reports net income of $866,582 against $330,000 for the preceding 12 months. With the deficit of the previous year brought forward and deducted there was a balance for the present year of $102,768. For dividends and interest on bonds of the subsidiary companies, depreciation and depletion there was allowed $1,410,717 against $1,498,628 in the previous year. The deficit carried forward in 1922 amounted to $763,813.

Pig Iron Output First Half of 1923

Compiled by the American Iron and Steel Institute

HALF-YEARLY PRODUCTION OF ALL KINDS OF PIG IRON.

States.	Blast furnaces.* In blast Dec. 31, 1922.	June 30, 1923. In.	Out.	Total.	Production—Gross tons. (Includes spiegeleisen ferro-mang., ferro-silicon, ferro-phosphorus, etc.) First half of 1922.	Second half of 1922.	First half of 1923
Massachusetts	1	0	1	1	.....	1,084	1,309
Connecticut	0	0	2	2			
New York	15	24	4	28	833,488	938,837	1,489,701
New Jersey	1	2	2	4			
Pennsylvania	90	125	28	153	4,339,560	5,392,228	7,794,398
Maryland	4	5	1	6			
Virginia	4	6	11	17	140,885	275,106	446,707
Alabama	25	30	13	43	963,019	1,267,600	1,460,813
Georgia	0	0	2	2			
Texas	0	0	1	1			
West Virginia	3	4	1	5	240,822	219,489	355,294
Kentucky	1	2	5	7			
Mississippi	0	0	1	1			
Tennessee	6	7	10	17	17,585	106,322	142,879
Ohio	58	67	13	80	2,898,846	3,585,316	4,978,327
Illinois	18	24	2	26	1,237,877	1,387,367	1,899,231
Indiana	14	16	0	16			
Michigan	13	12	1	13	1,252,733	1,473,994	1,825,759
Wisconsin	4	5	2	7			
Minnesota	3	3	0	3	102,809	278,221	396,958
Missouri	0	0	3	3			
Iowa	0	0	0	0	163,387	103,329	225,009
Colorado	3	3	2	5			
Total	263	335	105	440	12,191,011	15,028,893	21,016,475

*Completed and rebuilding.

HALF-YEARLY PRODUCTION OF COKE PIG IRON.*

Connecticut	0	0	0	0			
New York	15	24	3	27	833,488	939,159	1,489,701
New Jersey	1	2	2	4			
Pennsylvania	90	124	24	148	4,339,560	5,392,228	7,785,632
Maryland	4	5	1	6			
Virginia	4	6	11	17	140,885	275,106	446,797
Georgia	0	0	1	1			
Texas	0	0	1	1			
Alabama	24	28	12	40	949,566	1,255,839	1,448,404
West Virginia	3	4	1	5	240,822	219,489	355,294
Kentucky	1	2	5	7			
Tennessee	6	6	8	14	17,585	106,322	140,762
Ohio	58	67	13	80	2,898,846	3,585,316	4,978,327
Illinois	18	24	2	26	1,237,877	1,387,367	1,899,231
Indiana	14	16	0	16			
Michigan	4	4	0	4	1,256,880	1,463,838	1,892,703
Wisconsin	3	4	2	6			
Minnesota	3	3	0	3			
Missouri	0	0	2	2	190,716	264,284	437,389
Iowa	0	0	0	0			
Colorado	3	3	2	5			
Total	251	322	90	412	12,106,225	14,888,948	20,874,240

*Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.

HALF-YEARLY PRODUCTION OF ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

Pennsylvania	0	1	2	3	.....	.....	8,766
Total	0	1	2	3	.....	.....	8,766

HALF-YEARLY PRODUCTION OF CHARCOAL PIG IRON.

Massachusetts	1	0	1	1			
Connecticut	0	0	2	2	.....	762	1,309
New York	0	0	1	1			
Pennsylvania	0	0	2	2			
Alabama	1	2	1	3			
Georgia	0	0	1	1	13,453	11,761	14,526
Tennessee	0	1	2	3			
Mississippi	0	0	1	1			
Michigan	9	8	1	9			
Wisconsin	1	1	0	1	71,333	127,422	117,634
Missouri	0	0	1	1			
Total	12	12	13	25	84,786	139,945	133,469

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke*	251	322	90	412	12,106,225	14,888,948	20,874,240
Anthracite†	0	1	2	3	.....	.....	8,766
Charcoal	12	12	13	25	84,786	139,945	133,469
Total	263	335	105	440	12,191,011	15,028,893	21,016,475

* Includes pig iron and ferro-alloys made with electricity, electricity and coke, etc.
† Includes mixed anthracite and coke pig iron.

HALF-YEARLY PRODUCTION OF BASIC PIG IRON.

States.	First half of 1922.	Second half of 1922.	First half of 1923.
New York, New Jersey	428,536	385,697	508,343
Pennsylvania—Allegheny County	1,248,060	1,575,825	1,864,180
Other counties	1,100,324	1,463,217	2,340,889
West Virginia, Alabama, Kentucky	641,200	691,170	819,848
Ohio	1,257,315	1,424,495	2,040,027
Indiana, Illinois	1,534,969	1,722,927	2,232,602
Michigan, Wisconsin, Minnesota, Colo.	179,472	188,160	375,434
Total	6,389,876	7,451,491	10,181,323

HALF-YEARLY PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

Connecticut, New York	50,541	91,975	189,407
Pennsylvania	1,516,802	1,865,347	2,754,665
Md., West Va., Ky., Ala., Tenn.	193,115	232,927	471,270
Ohio	1,199,416	1,547,878	2,138,361
Indiana, Illinois, Iowa, Wis., Colorado	552,730	562,472	819,284
Total	3,512,604	4,300,599	*6,372,987

* Includes 140,251 tons of low-phosphorus pig iron.

HALF-YEARLY PRODUCTION OF FOUNDRY PIG IRON AND FERRO-SILICON.

Massachusetts, Connecticut	.....	870	1,309
New York, New Jersey	308,129	353,606	587,348
Pennsylvania	305,792	296,126	506,990
Maryland, Va., West Va., Ky., Tenn.	36,853	168,283	320,925
Alabama	459,563	708,348	731,271
Ohio	219,069	280,172	443,335
Indiana, Illinois	82,192	119,096	138,732
Michigan	130,763	295,685	313,013
Wisconsin, Minnesota, Iowa, Colorado	86,868	125,016	162,512
Total	1,629,229	2,347,202	*3,205,435

* Includes 134,029 tons of ferro-silicon.

HALF-YEARLY PRODUCTION OF MALLEABLE PIG IRON.

New York	35,348	66,462	161,042
Pennsylvania, Maryland	17,945	45,208	59,118
Ohio	195,036	287,811	296,138
Indiana, Illinois, Mich., Wis., Minn.	179,669	224,016	298,073
Total	427,998	623,497	814,371

HALF-YEARLY PRODUCTION OF FORGE PIG IRON.

New Jersey, Pennsylvania	65,845	56,184	118,513
Alabama	10,181	11,998	16,436
Ohio	26,858	43,144	50,676
Total	102,884	111,326	185,625

HALF-YEARLY PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania, Maryland, Ala., Tenn.	96,555	127,003	188,835
Total	96,555	127,003	*188,835

* Includes 124,025 tons of ferro-manganese and 64,810 tons of spiegeleisen.

HALF-YEARLY PRODUCTION OF OTHER GRADES.

New York, New Jersey	4,269	33,333	25,143
Pennsylvania	1,443	3,029	5,181
Maryland, Va., West Va., Tenn., Ala.	14,858	24,008	20,478
Ohio	1,152	1,816	9,790
Indiana, Illinois, Minnesota	10,143	5,539	7,307
Total	31,865	67,775	67,899

PIG IRON MADE FOR SALE OR FOR USE OF MAKERS IN THE FIRST HALF OF 1923.

Grades.	For sale.	For maker's use.	Total. Gross tons.
Basic	1,108,965	9,072,358	10,181,323
Bessemer and low-phosphorus	500,490	5,872,497	6,372,987
Foundry, including ferro-silicon	2,954,936	250,499	3,205,435
Malleable	773,983	40,388	814,371
Forge or mill	103,611	82,014	185,625
Ferro-manganese	41,512	82,513	124,025
Spiegeleisen	33,193	31,617	64,810
All other grades	33,629	34,270	67,899
Total	5,550,319	15,466,156	21,016,475

More Pig Iron

Made in First Half of 1923—Total Was 21,016,475 Tons

Pig iron produced in the United States during the first half of 1923 totaled 21,016,475 gross tons, according to the official production figures just announced by the American Iron and Steel institute. This total was an increase of 8,825,464 tons over the 12,191,011 tons made in the first half of 1922. During the last six months of 1922, pig iron produced totaled 15,028,983 tons, this figure being 5,987,582 tons less than that made during the first half of the current year.

The accompanying table shows the various divisions of production. Of the grand total of 21,016,475 gross tons, 20,874,240 tons was made with coke as fuel, 8766 tons was made with anthracite or mixed coke and anthracite and 133,469 tons was made with charcoal. In the corresponding period of last year, 12,106,225 tons was made with coke, none was made with anthracite or mixed coke and anthracite, and 84,786 tons was made with charcoal. In both years the coke pig iron includes ferroalloys made with electricity, electricity and coke, etc.

According to grades, the output of pig iron for the first half of 1923 was as follows: Basic, 10,181 323 tons; bessemer and low phosphorus, 6,372,987 tons; foundry, including ferrosilicon, 3,205,435 tons; malleable, 814,371 tons; forge or mill, 185,625 tons; ferromanganese, 124,025 tons; spiegeleisen, 64,810 tons; and all other grades, 67,899 tons. Of the total iron made, 15,466,156 tons was made for the makers' use and 5,550,319 tons was made for sale. The ratio of merchant to nonmerchant iron, therefore, was 35.9 per cent. In the first half of 1922, the ratio of merchant to nonmerchant iron was 30 per cent.

In order of the size of their outputs Pennsylvania stood first with 7,794,398 tons; Ohio second with 4,978,327 tons; and Illinois third with 1,899,231 tons. Pennsylvania and Ohio alone produced over half of the total. On a percentage basis, Pennsylvania made 37 per cent of the country's total; Ohio, 23.7 per cent; and Illinois, 9 per cent. The three states produced about 69.7 per cent of the country's total.

Business Leaders Confer with President

Washington, Aug. 28.—The position of American business on important economic questions facing the country were put before President Coolidge last week by a committee representing the Chamber of Commerce of the United States.

The subjects which the committee took up included international relations, railroad transportation, merchant marine, tax reforms, national budget, immigration, veteran legislation, tariff and federal reserve system.

The chamber's position in tax reforms was outlined as follows:

Repeal of remaining war excise taxes with any needed revenues obtained from a sales tax.

Readjustment of income surtaxes for the purpose of making them more fruitful in revenue by bringing back into productive and tax-yielding enterprise large amounts of capital which have been diverted into investments the income from which is free from federal taxation.

Future issues of federal obligations should have their interest subject to the federal tax.

Court of tax appeals, independent of the treasury department, should be set up with such procedure and jurisdiction as to assure an early and impartial decision upon substantial questions.

Canadian Iron Production Drops in July

Production figures of Canada for the month of July were issued recently by the Dominion bureau of statistics. In that month a total of 81,647 tons of pig iron was produced as compared with 99,239 tons during June, or a decrease of 17.7 per cent. The decline was due mainly to the strike at the Sydney plant. The total of pig iron produced in the first seven months of the year, or 516,793 tons, is an increase of 231 per cent over the corresponding period in 1922 and an increase of 142 per cent over 1921, when 223,982 tons and 363,292 tons respectively were produced.

Production of steel ingots and castings during July totaled 73,532 tons, as compared with 96,167 tons in June. The total production for the first seven months of 1923 is 549,062 tons, as compared to the production for the same period of 1922 when the total was 349,118 tons, and in 1921 when 239,847 tons was produced.

Ford Output Still Climbs

Detroit, Aug. 28.—Ford Motor Co. made another climb toward its goal of 10,000 cars daily when on Aug. 15 it turned out 7309 motor cars and trucks for domestic use, 39 cars in excess of its previous high mark. The total output for the week ended Aug. 21, was 34,744 cars and trucks. The company turned out 1721 tractors and in the Lincoln division produced 201 cars.

Lower Prices

in Motor Benzol Following Weakness in Gasoline

New York, Aug. 28.—Lower prices on motor benzol, following the weakness in gasolene has had little effect upon the market for industrial benzol and other light oil distillates. Quotations on pure benzol continue to hold firmly at 27 cents works in tanks and 32 cents in drums; 90 per cent benzol, 25 cents in tanks and 30 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; and commercial xylol, at 29 cents in tanks and 30 cents in drums. Demand, however, is rather dull and featureless.

The situation in sulphate of ammonia is also unchanged, demand being sluggish and prices steady. Sellers look for little improvement before fall at which time the fertilizer manufacturers usually come into the market for ammonia to supplement their yearly contracts. Some sellers of sulphate of ammonia are also confident that there will be a revival in foreign buying by that time. At present little interest is manifested abroad, and current prices of $3.30 to $3.35 in double bags, port, are largely nominal. The domestic marke is quoted at $3.05 to $3.10 works. A factor in the continued steadiness of the market in face of the small volume of current business is a large quantity of material going into long term contracts.

Naphthalene continues to reflect the dullness of the past several weeks. However, a revival is expected to set in next month, the analine dye manufacturers usually figuring on additional requirements in September. Prices are unchanged at 8 cents works for flakes and 9 cents for balls.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29
Per Pound at Producers' Plants	
Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$3.05 to $3.10
Contract	
Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29
Per Pound at Producers' Plants	
Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09

*Spot distillates are subject to shading.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Sullivan Machinery Co., Michigan City, Ind., makers of mining and prospecting machinery, held its formal opening recently. Two hundred employes of the Chicago plant of the company arrived on a special car which was switched on to the company's tracks and taken direct to the plant, where officials conducted the party and a number of Michigan City business men through the plant. Addresses were given at the luncheon by Frederick K. Copeland, president of the company, other officials, President E. G. Richter and secretary-manager W. K. Greenebaum of the chamber of commerce.

Among the officials in Michigan City for the affair were the president, F. K. Copeland, S. T. Nelson, general superintendent, A. D. Ferguson, assistant superintendent, vice presidents, A. E. Blackwood and H. T. Walsh and Thomas W. Fry, secretary, the latter of Claremont, N. H., the home of the eastern plant of the Sullivan company.

* * *

INJUNCTIONS to restrain the Newport Foundry Co., Frankfort, Ky., from operating at night and on Sundays were overruled recently by Judge Ernest Clarke of the court of appeals.

* * *

THE Wollaston Foundry Co., Norfolk Downs, Mass., iron founder and machinist, has been petitioned in bankruptcy by three creditors whose claims total $1270.98. The business was established in 1810 and incorporated in 1873.

* * *

CHARLES W. MORSE in New London, Conn., Aug. 21, declared his hope to start the Groton Iron Works of that city again when litigation with the government over its affairs is terminated.

* * *

THE Republic Mining & Mfg. Co. of Georgia lately has acquired extensive mineral land deposits in the vicinity of Abbeville, Ala., and is planning the development of the properties at once, principally for the production of bauxite.

* * *

FLORANDIN EQUIPMENT CO., 110 West Fortieth street, New York, has been appointed by the H. D. Conkey Co. as New York sales agent for its products. The Florandin company is also New York sales agent for hoists manufactured by the American Engineering Co.

* * *

THE Anniston Electric Steel Corp., Anniston, Ala., is retiring from the car building and repairing business and is now devoting all its productive capacity to its steel and gray iron foundries. It is offering for lease its car shop department 100 x 530 feet, with storage of 50 x 145 feet.

* * *

THE Day-Evans Iron Works, a new corporation formed recently at Knoxville, Tenn., will establish in that city a large foundry and machine shop for the manufacture of mine cars and wheels, mining equipment, etc., according to an announcement recently by A. W. Evans manager of the company. A total investment of about $200,000 is planned. Mr. Evans states, in the construction of four buildings which will comprise the plant proper.

* * *

MAURICE G. DESSEAU, Buffalo, N. Y., is to establish a factory in Hudson, Mass., for the making of a universal joint driving axle for automobile trucks, of which he is the inventor. The trucks will be built elsewhere and assembled in the Hudson plant. J. N. Lapointe and his son, Ralph R. Lapointe of the J. N. Lapointe Co., New London, Conn., machine tools, have associated themselves with Mr. Desseau in the organization of a company to build the trucks.

* * *

THE Crown Mountain Mining & Mfg. Co., recently formed in Atlanta with $1,000,000 capital, with headquarters at 402 Grant building, has obtained extensive properties near Dahlonega, Ga., and will start development work there, producing iron, copper, magnetite, etc., according to John B. Hutchins, secretary and treasurer of the company. Mr. Hutchins further advises that the company is in the market for considerable equipment for mining, transportation, melting, power plant operation, etc.

* * *

THE fire which recently damaged the Newark ball club park, Harrison, N. J., did not damage the Driver-Harris Co. that city, as first reports of the fire in newspapers may have indicated. The conflagration did not touch any part of the manufacturing buildings, the rear end of a fireproof garage alone being scorched. Production was in no way interfered with.

* * *

T A. CUMMINGS FOUNDRY CO., 1338-1372 Cortland street, Chicago, plans to increase its production by 50 per cent. It also contemplates the construction of a fireproof pattern storage house, 40 x 90 x 100 feet. The capital of the company was recently increased to $200,000. All equipment for the expansion is reported to have been bought.

* * *

NO PLANT will be built at this time by the Vaco Washer Co., Sabina, O., recently incorporated for the purpose of manufacturing electric washing machines of the vacuum oscillating type. Officers of the new company are: R. W. Allen, president; A. N. Haines, vice president; George L. Wilson, secretary; R. W. Cline, treasurer; and H. O. McDaniel, general manager.

* * *

THE Mystic Iron Works has been organized to produce pig iron for the New England market. It has petitioned the city and state authorities for the necessary permits for the construction and operation of blast furnaces at Everett, Mass. There are at present no blast furnaces in New England. The proposition will involve an investment estimated at from $3,000,000 to $4,000,000.

* * *

ORGANIZATION of the Pharo Governing Co. with a capital of $30,000 was recently effected by the officials of Bethlehem Fabricators, Inc., manufacturers of structural steel shapes and the Pharo Mfg. Co., manufacturer of mechanical specialties, both of Bethlehem, Pa. A plant will be established and operated for the manufacture of governors for internal combustion engines, automotive equipment and metal goods. Officers of the new company will include Richard Chapman, G. C. Pharo and R. P. Heilstrom.

Tone of Machinery Market Better

Total Sales for August Show Increase over July—Numerous Inquiries Being Brought Out from all Lines—Dealings in Second-Hand Equipment Decline—Activity Found in Cranes

RAILROAD buying, especially in the New York district, is the feature of the machine tool market for the week. The Seaboard Air Line, Central Railroad of New Jersey, and the Elgin, Joliet & Eastern are making substantial purchases on lists current for several weeks and it is reported the Pennsylvania will close on a list soon.

A healthier market condition is noted in several of the tool centers of the country. The volume of sales is on the increase, the total for August slightly exceeding that for July. Numerous inquiries have been brought out during the week, the bulk coming from the manufacturers of automobiles and accessories, although diversified manufacturing interests have shown a tendency to buy. This condition has caused men of the industry to anticipate a general pick up during September and October. That a good export business was closed during August strengthens the belief in future business.

On the other hand sales have declined in the second-hand machinery market, while inquiries have fallen off until practically none are being brought out. Buyers are shopping around for the few tools that are being bought. It is thought that sales for the month will fall below those for July.

Considerable activity is being shown in the crane market. Sales are keeping up and a good volume of business is pending. Manufacturers report that plants are extremely busy.

A Number of Railroads Purchase New Equipment

NEW YORK, Aug. 28.—Activity on the part of some of the railroads has given a better tone to the machine tool market. The Seaboard Air Line has begun to close on a list of 20 machine tools, valued approximately at $80,000, and the Central Railroad of New Jersey has distributed orders for several machines, including two turret lathes, two 20-inch engine lathes and two 18-inch engine lathes. A few machines, including some fabricating equipment, are still to be purchased. The Elgin, Joliet & Eastern, has also been a further buyer, closing on some equipment to manufacturers in this district. It is estimated that the Elgin, Joliet & Eastern has now closed on approximately $100,000 of equipment.

While the market as a whole reflects seasonal dullness and some trade interests expect little revival before Labor day, a feature is the appearance of several inquiries which were first brought out several weeks ago. None of these is large but nevertheless indicate a more active interest among buyers. Another encouraging development is an improved demand for export.

While orders for foreign shipment are confined almost entirely to single machines, it is interesting to note that business is coming out from numerous countries. Of late, orders have been received from Japan, the Philippines, Venezuela, Mexico, Colombia, Ecuador, and Cuba and several orders have been reported for shipment to England. At present, some substantial business is pending for the Philippines and Cuba, the revival of the sugar industry in this latter country being a factor. The United Fruit Co., 40 Rector street, is inquiring for a wheel lathe for export and is also understood to be in the market for a planer, milling machine and one or two other items.

Included in recent domestic orders is a 15 x 12 x 30-foot planer, for the Hoovens-Owens Renecheler Co., Hamilton, O., the business going to an eastern builder; and a 6-foot, horizontal boring and milling machine for the Pittsburgh Plate Glass Co. The American Locomotive Co., is figuring on a few machines for its Richmond, Va. plant, including a 60-inch lathe, and an angle shear. The American Can Co., is adding to its recent substantial purchases of equipment for Geneva, N. Y. The General Electric Co., Schenectady, N. Y., is figuring on a few machines.

The Ford Motor Co., is figuring on a production next season of 10,000 cars per day and is now buying equipment against this output, according to information received here. No action has as yet been taken by the city department of purchases on the list of seven or eight machine tools.

Outstanding in the local crane market is an award of eight electric cranes, ranging from 5 to 15 tons capacity, for the Edward G. Budd Mfg. Co., Philadelphia.

Conditions Are Better

CLEVELAND, Aug. 28.—Reports from dealers and manufacturers indicate an upward trend in the machinery market in this district. Sales have shown a slight betterment during the week and a considerable increase is noted in the number of inquiries current. While the majority of lists are from automobile manufacturers, many other companies are asking for quotations, including manufacturers of refrigerating machines and washing machines, pipe foundries, steel fitting companies, tool manufacturers, etc. With the buying of the automotive industry and the well distributed call for tools in other industries, several men of the trade have expressed the opinion that a substantial increase in business will be had during the months of September and October. August business showed a slight increase over the total for July.

Trading in the second-hand machinery market is exceedingly dull. Few sales are reported for the week, with small lots ruling the business closed. One dealer reports the sale of several machines to a St. Louis manufacturer. Inquiries have dropped off until at present there are practically no lists being brought out. While dealers still believe that a substantial increase in business will be experienced during the month of September, there seems to be nothing in the present condition of the market to strengthen this belief. Taking the market as a whole, the volume of sales for the month of August will fall slightly below the total realized during July.

Business in the crane market continues good. Considerable business is pending and prospects for the future look bright.

Railroad Purchases Good

CINCINNATI, Aug. 28.—Machine tool buying in this district is restricted chiefly to small lots. Rail-

roads continue the most important factor, although no new inquiries have come to light during the past week. Purchases by railroads represent about 75 per cent of the total volume of business for August. Inquiries have slackened and many of the plants are working only five days a week. Manufacturers anticipate an improvement in business next month.

Used machinery has been moving at a fair rate, although inquiries have almost entirely disappeared. Considerable shopping around on the part of prospective buyers is being done, and price cutting is necessary in order to close sales.

The Cincinnati Enameling Co., which has taken over one of the properties of the Cisco Machine Tool Co. for manufacturing purposes, has purchased a quantity of oil burning equipment from the L. H. Brady Co. Cleveland. The W. T. Johnston Co., dealers in used machinery reports a number of sales, as does the Cincinnati Milling Machine Co. and the Cincinnati Planer Co.

Market Exceptionally Quiet

BOSTON, Aug. 25.—As in the preceding week, the feature of the machine tool market has been the scarcity of orders. Practically no business of any size was reported during the past week and dealers are not anticipating much in the way of substantial orders until next month. Inquiries are limited, consisting largely of small lists. It is understood, however, that there is one important inquiry from a textile concern in the market.

Prices continue to hold steady and there seems to be no disposition to mark down prices, the trade generally regarding the lull as a seasonal condition which will be corrected in due course. It is reported that one lathe manufacturer in the Middle West has advanced the price of gear-head lathes 12 per cent, but this alteration was made to bring his prices into line with those generally prevailing. In the line of textile machinery prospects, the Jules Desurmont Worsted Co. has awarded a contract for construction of $175,000 addition to its mill in Woonsocket, R. I., and the Earnsdale Worsted Co., Clinton, Mass., has let the contract for erection of an addition to its mill which will employ twenty-five additional men.

The second-hand market is also quiet. One dealer reports the purchase of a small number of tools during the week, but no sales were reported by him.

Conditions Are Sound

PITTSBURGH, Aug. 28.—Sound conditions undoubtedly underly the machine tool and equipment market although at present the midsummer dullness still hangs on to a greater or less extent. Purchases by the Pennsylvania railroad on its large list for lines west, still are deferred. Bids are being tabulated in Philadelphia but closing action probably will not take place for several days. Buying of new equipment continues to involve one or two machines at a time, representative sales noted this week being two 28-inch shapers to a western user; a 60-inch boring mill to a local manufacturer; one each motor-driven lathe and shaper to a West Virginia coal company on an inquiry quoted upon last April; together with several other similar transactions reported by several dealers. The accelerated movement of structural shop and plate working machinery noted last week continues. One company closed on approximately $40,000 worth this past week and expects to buy twice as much this week, including some punches and shears. While large lists are absent from new inquiries, a better inquiry rate exists than four or five weeks ago and prospects are bright for September and October.

In the used machinery field considerable inquiry exists between dealer and dealer idicative of the fact that there is considerable shopping around for types of used machines which are scarce because they do not long remain in stock. One inquiry from Florida involves eight or ten items. A few of the sales noted this week involved a 30-inch planer and a vertical boring mill to local users.

Inquiries pending for cranes aggregate something like 40 or 50 items, including 14 small cranes for Carnegie Steel Co. and the 15 to 20 cranes for the Jones & Laughlin Steel Corp. The crane mar-

Crane Awards and Inquiries of the Week

Orders Placed

One 15-ton crane for the Railway Steel Spring Co., Latrobe, Pa., through Manning, Maxwell & Moore, Inc., to the Shaw Electric Crane Works, Muskegon, Mich.

One 10-ton crane with 80-foot span for the Steel Car Forge Co., Sllwood City, Pa., through Manning, Maxwell & Moore, Inc., to the Shaw Electric Crane Works, Muskegon, Mich.

One 25-ton locomotive crane for the Edgar Thomson works, Carnegie Steel Co., to the Brown Hoisting Machinery Co., Cleveland.

One 20-ton locomotive crane for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to the Brown Hoisting Machinery Co., Cleveland.

One 30-ton locomotive crane for the Mingo Junction, O., plant of the Carnegie Steel Co., to the McMyler Interstate Co., Bedford, O.

One standard gage locomotive crane for the Bellaire, O., plant of the Carnegie Steel Co., to the Link Belt Co., Chicago.

One whirler crane complete with docks, etc., for the Carnegie Steel Co., Bellaire, O., to the Dravo Contracting Co., Pittsburgh.

One 10-ton electric crane, 38-foot 8-inch span, for the Fitzgibbons Boiler Co., New York to the Bedford Foundry & Machine Co., through Philip T. King, 30 Church street, New York.

Three 15-ton cranes for the American Telephone & Telegraph Co., New York, to the Industrial Works, Bay City, Mich.

One 160-ton wrecking crane for the Big Four railroad, to the Industrial Works, Bay City, Mich.

One 20-ton locomotive crane for the Koss Construction Co., Des Moines, Iowa, to the American Hoist & Derrick Co.

One ditcher for the Virginian railway, to the American Hoist & Derrick Co.

One 100-ton electric crane, 41-foot span, for the Phoenix Utility Co., 71 Broadway, New York, to an eastern builder.

Eight electric overhead cranes for the Edward G. Budd Mfg. Co., Philadelphia, to an eastern builder. Specifications call for one 15-ton crane, 78-foot span; one 10-ton and six 5-ton cranes, 22-foot span.

One ditcher for the Tennessee Coal Iron & Railroad Co., to the American Hoist & Derrick Co.

One 60-ton, 1-motor crane, 24-foot span, for the Phoenix Utility Co., to the Cleveland Electric Crane & Engineering Co.

One 3-ton overhead crane for the Irving Iron Works Long Island City, to the Yale & Towne Mfg. Co.

One monorail system for Hills Bros., Brooklyn, to the tramrail division of the Cleveland Crane & Engineering Co., through George P. Morse, 110 William street, New York.

One tramrail system for V. Vivandou Co., Inc., Brooklyn, to the tramrail division of the Cleveland Crane & Engineering Co., through George P. Morse, 110 William street, New York.

One 3-ton underhung crane, 20-foot span, for Rehburger Sons Co., Newark, N. J., to the New Jersey Foundry & Machine Co.

One 600-foot monorail I-beam system for the Hungerford Brass Co., for installation at Boston, to the New Jersey Foundry & Machine Co.

One 2-ton handpower crane, 28-foot span, for a Brooklyn company, purchased from the New Jersey Foundry & Machine Co. through a dealer.

Several hoists ranging up to six tons capacity, for the Gregg Co., Ltd., Hackensack, N. J. to unnamed builder.

One 25-ton locomotive crane and one 30-ton locomotive crane for the Pennsylvania railroad, Pittsburgh, to the Industrial Works, Bay City, Mich., through Ridenour, Seaver & Kendig, Cleveland.

One 35-ton locomotive crane for the Pittsburgh & Lake Erie railroad to the Industrial Iron Works, Bay City, Mich, through Ridenous, Seaver & Kendig, Cleveland and Pittsburgh.

Orders Pending

Fifteen assorted cranes for the new bar mill of the Jones & Laughlin Steel Corp., Pittsburgh, together with soaking pit cranes, revolving charges, etc.; bids being tabulated.

Ten cranes for the A. M. Byers Co. plant expansion, Hubbard, O.; matter held in abeyance for the time being.

Fourteen 3-ton open-hearth jib cranes for the Duquesne works of the Carnegie Steel Co., (not Edgar Thomson works as incorrectly reported hitherto); bids being tabulated.

Five cranes for the Pittsburgh Plate Glass Co., Creighton, Pa.; action to be taken early this week.

One 30-ton locomotive crane with magnet and 50-foot boom, air brake, etc., for the Pittsburgh & Lake Erie railroad; order to be placed early this week.

ket is featured by the long-deferred activity of the Carnegie Steel Co. in connection with locomotive cranes for Bellaire, Mingo Junction and Edgar Thomson plants. The Westinghouse Electric & Mfg. Co. also bought a locomotive crane and the Pittsburgh & Lake Erie railroad expect to close early this week. The Railway Steel Spring Co., Latrobe, Pa., and the Steel Car Forge Co., Ellwood City, Pa., each bought overhead traveling cranes, 15 and 10-ton capacity, respectively. For the present, no cranes will be bought for the new strip mill at Warren, O., to be conducted by C. D. Thomas and others for which proposition Barton Shover, Oliver building, Pittsburgh, is engineer. The strip mills, gang slitters, and other equipment are being bought early this week. The building to be occupied by the new company already is equipped with a 20-ton crane but perhaps later on small cranes for the handling of raw material will be purchased. The Cambria Steel Co. is understood recently to have closed upon tables, shears, etc., with the Mesta Machine Co.

Business Is Satisfactory

TORONTO, Ont., Aug. 27.—While the demand for machinery and machine tools has not been very active during the past week or ten days, dealers and builders still report a satisfactory amount of business coming their way. The automobile industry has been furnishing the bulk of the present demand and orders from this source both for replacement and on new works account has been good. The electrical development trades has also furnished a good demand for equipment of late and municipal governing bodies have been frequent buyers of equipment for waterworks and sewage plants, the demand for the latter commodities having shown considerable improvement of late, while inquiries are out for still larger quantities of equipment on this account.

The opening of the Canadian National exhibition in Toronto on August 25 is expected to be a factor in stimulating the demand for machine tools. During the past two weeks orders were confined to tools in small units which in addition to the placing of contracts on the list issued by the Toronto Transportation commission some months ago has resulted in a fair amount of business. The demand for small tools is holding strong and dealers report a good volume of orders coming their way.

C. Alfred Maguire, mayor, chairman of the board of control, Toronto, Ont., will receive bids until Sept. 4, for the supply of one 3-motor electric traveling crane.

Bulletin Board

Requests for Equipment and Supplies, Trade Literature, Etc., Made Through IRON TRADE REVIEW

A well known firm in Poland is desirous of obtaining an agency of an American manufacturer of metal and woodworking machinery, electric motors, etc. If possible exclusive agency for Poland is desired, or at least for the territory of Poznan and Pomorze. Credit references and additional information may be obtained upon application at the American Polish Chamber of Commerce, 953 Third avenue, New York.

* * *

Ridenour, Seaver & Kendig, factory representatives, 310 Caxton building, Cleveland, and 609 Chamber of Commerce building, Pittsburgh, are desirous of representing the manufacturers of a line of electric traveling cranes.

* * *

The R. B. Collins Sprayer Co., 190 Territorial road, Benton Harbor, Mich., has advised the only equipment it is in the market for at this time for its new building consists of a small pipe threading machine and a table saw.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

MONTGOMERY, ALA.—The National Carbon Co., Inc. of New York, will establish a branch plant here. Fred S. Ball, First National Bank building, Montgomery, will be official agent of the company.

BRIDGEPORT, CONN.—Plans for the erection of a new 1-story addition have been filed by the Bridgeport Hardware Mfg. Corp., Iranistan avenue.

NEW HAVEN, CONN.—The Alderman Iron & Metal Co. has been incorporated with $25,000 capital by A. F. Alderman, Max A. Alderman and Abraham N. Alderman.

ROCKY HILL, CONN.—Awarding of the contract for the erection of a 20 x 30-foot addition to the plant of the Connecticut Foundry Co., this city, to Charles P. Waterman, Inc., was recently effected. The addition will be equipped for cupola service.

STAMFORD, CONN.—Bids closed Aug. 24 for a 160 x 325-foot factory building here for the Norma Co. of America, Long Island City, N. Y., maker of ball bearings.

WATERBURY, CONN.—Contract for the erection of a 25 x 62-foot mill addition for the Thin Sheet Metals Co., Railroad Hill street, was recently awarded to the Tracy Bros. Co., this city.

WATERBURY, CONN.—M. J. Daly & Sons, Inc., dealer in mill supplies, has increased its capital stock to $400,000 by a stock dividend of $250,000 and an additional issue of capital stock of $100,000.

WILMINGTON, DEL.—The Sioux Iron & Development Co., was incorporated for $250,000 to manufacture iron and steel, etc.

WILMINGTON, DEL.—The Scranton Supply & Machinery Co. was incorporated with a capital stock of $150,000 to manufacture tractors and other machinery.

WILMINGTON, DEL.—The Triumph Electric Heating Corp. of Southern California, was incorporated here recently with a capital of $1,500,000.

WILMINGTON, DEL.—The Hamilton Furnace Co., this city was recently incorporated with a capital of $5,000,000 to manufacture iron and steel.

JACKSONVILLE, FLA.—The Florida Screw Machine Products Co. was organized and incorporated the latter part of August with a capital of $50,000, for the general manufacture of machinery, hardware products, engines and boilers. Officers are M. F. Marshall, president; M. Howell, vice president, and T. Duncan, secretary and treasurer.

TAMPA, FLA.—The Whiting Railway Motor Car Co. has been organized with $200,000 capital for the manufacture and repair of railway cars. Officers are A. J. Stuckey, president; J. A. Whiting, vice president, and F. W. Brown, secretary and treasurer.

CHICAGO—The Mitchell Metal Specialty Co. was incorporated for $10,000 to deal in metal goods and merchandise. The offices are located at 5661 North Clark street.

CHICAGO—Aluminum Foundries, Inc., 234 South Wells street, recently incorporated with a capital of $100,000 and 4000 shares non par value common stock. The company will deal in aluminum ware and products.

CHICAGO—A 2-story 57 x 112-foot factory building is being planned by the Chicago Window & Door Screen Co., 5118 South State street. M. Eichberg, 64 West Randolph street, is architect.

CHICAGO—Twin Bearing Co. was incorporated recently for $500,000 to manufacture and sell bearings of steel, iron and other

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.55c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.65c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.25c
Seattle	5.00c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.45c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	6.00c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.60c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	6.05c to 6.15c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	7.00c
St. Louis	6.45c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.35c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angles (rounds)	5.90c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh	4.25c
San Francisco (rounds)	5.75c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

metals. It is located at 106 North LaSalle street.

CHICAGO—Contracts for the construction of a 6-story 56 x 178-foot building for the Curtis Leger Fixture Co. were let recently. Work on the building has already been started. It will cost approximately $225,000. The company manufactures lighting fixtures.

CHICAGO—Indestructo Bumper Corp., 155 Carl street, was incorporated with a capital stock of $100,000. It will deal in and manufacture automobile bumpers, machines, tools, and equipment. The incorporators were George Hein, Peter Lang, and Ernest Luehr.

CHICAGO.—The Munson Steel & Tube Co., Thirty-second street and Maplewood avenue, recently was incorporated with $25,000 capital. Incorporators were Samuel M. Priess, Samuel J. Fernberg and Milton K. Markman. The Munson company will manufacture, produce, buy and sell pipe fittings, valves, and steel products.

CHICAGO—Purchase of the foundry of the Brady Foundry Co. plant containing 100,000 feet of floor space, located at Western avenue and Forty-sixth street, was made by the Wolff Mfg. Co., manufacturer of plumbing supplies. The Wolff company will turn the new plant into one of the largest bathtub foundries in the United States, having an initial capacity of 900 tubs a day.

GILLESPIE, ILL.—The American Car & Foundry Co. has purchased a $50,000 plot of land for an addition to its plant at Blue Island.

BRAZIL, IND.—Reorganization to provide for contemplated expansion is being planned by Crawford & McCrimmon Co., manufacturers of mine engines and pumps.

COLUMBUS, IND.—It is reported that the Columbus Machine Works is preparing to move its plant to Crothersville, Ind.

FORT WAYNE, IND.—A 1-story plant addition, 60 x 110 feet, will be built by the Wayne Tank & Pump Co. A second building is being planned which will be an addition to the factory, devoted entirely to the assembly and testing of pumps. The improvements are estimated to have a value of $80,000.

LOUISVILLE, KY.—Standard Sanitary Mfg. Co., is reported to have let the contract to Patoof & Bush, 118 West Liberty street, to erect a foundry, sand blast, sand drier and oxyacetylene welding buildings of reinforced concrete and steel construction.

WAYLAND, KY.—Fire damaged the repair building of the Elk Horn Coal Corp. causing a loss of $40,000. Production of coal has been hindered and a stock of repair parts and mine supplies badly damaged.

BRUNSWICK, ME.—The Thomas Plow Co. has been organized to manufacture tractor snow plows and equipment to be used in conjunction with the Ford company's tractor. H. S. Thomas heads the new company.

LEWISTON, ME.—Manual training equipment will be installed in the new Lewiston high school addition. Bids have been called on the general contract.

BOSTON—Erection of a new 1-story mechanical shop at the rear of 185 Freeport street will be commenced soon for the Shawmut Engineering Co.

BOSTON—Julius Nicholson, maker of tools, plans the erection of a 1-story, 40 x 100-foot brick factory building in the Hyde Park district.

SPRINGFIELD, MASS.—The general contract for the extensions and improvements of the local plant of the Moore Drop Forging Co., Fisk avenue, was awarded to the Adams & Ruxton Construction Co., this city.

WARE, MASS.—The Ware Foundry Co., whose main building was destroyed by fire June 7, resumed operations in its rebuilt foundry recently.

WOBURN, MASS.—The John J. Grothe Co., Inc., builder of trucks, is soon to build a reinforced concrete, 1-story, 100 x 200-foot factory.

BALTIMORE, MD.—A 1-story 60 x 250-foot addition, costing approximately $90,000 is contemplated by the Leonhardt Wagon Mfg. Co., Eighth and O'Donnell streets.

BALTIMORE, MD.—The Auto Illuminating License Co., 215 Equitable building, was in-

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includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

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If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

corporated for $100,000 to manufacture license tag holders. Incorporators were Harry F. Wittig, W. M. Chenoworth and others.

HAGERSTOWN, MD.—The Western Maryland Plumbers Supply & Hardware Corp., 10 Main avenue, was incorporated for $100,000 by Edward K. Batchell, Ollie K. Yourtee and others.

FLINT, MICH.—Mason Motor Truck Co. plans the erection of a paint shop addition, costing $25,000. It will be a 1-story 80 x 200-foot building.

LANSING, MICH.—Preliminary plans for the expansion of the plant of the Olds Motor Works now are under consideration. It is understood that approximately $1,500,000 will be appropriated for the purchase of land and equipment and the erection of additional buildings for the manufacture of 4 and 8-cylinder automobiles.

PORT HURON, MICH.—Negotiations for the purchase of a tract of property in the South Park section of this city have been concluded between the McLean Motor Car Co. and the chamber of commerce. A plant for the manufacture of a popular-priced automobile will be construction on the new site. The temporary address of the company is: Care of secretary, chamber of commerce, Port Huron, Mich.

GULFPORT, MISS.—The Lawler-Nauck Mfg. Co., was incorporated with a capital of $60,000 to manufacture machinery and novelties. Incorporators were D. C. Lawler, Charles E. Nauck, and others.

KEARNY, N. J.—The Western Electric Co. with offices at 100 William street, New York, has come into the market for another unit for its plant to be erected here. It is a power plant involving approximately 1500 tons of steel.

NEWARK, N. J.—The Vreeland Motor Co., Inc., Chestnut street, Hillside, has under consideration plans for an extensive increase of production. The Vreeland company produces motor trucks and buses.

NEWARK, N. J.—Installation of a machine repair and service works on the second floor of a building at Central avenue and Hudson street, will soon be made by the Herdman Motor Co., 313 Central avenue.

PERTH AMBOY, N. J.—A subsidiary company has been organized by the Lehigh Coal & Navigation Co., Philadelphia, for the erection and operation of a plant here to manufacture anthracite coke for domestic use. A 15-acre site has been purchased and it is expected to have the plant which will cost approximately $50,000, in operation before the end of this year.

GENEVA, N. Y.—The Finger Lakes Razor & Cutlery Co., was incorporated with 600 shares of preferred stock $50 par value, 600 shares of common with no par value and an active capital of $15,000. Incorporators were F. Frolich, M. Krug, and R. Jansen.

LOCKPORT, N. Y.—The Harrison Radiator Corp., manufacturer of automobile radiators, has awarded a contract to the Charles R. Hedden Co., Inc., 342 Madison avenue, New York, for the construction of a 1-story addition to the properties on South street. The addition will measure 155 x 396 feet and will cost approximately $500,000.

LONG ISLAND CITY, N. Y.—Plans for rebuilding the Panther Motor Co., Inc., 481 Verona avenue, Long Island City, are now under way. The plant was recently damaged by fire to an extent of approximately $300,000.

NEW YORK—The Rhinewalder Die & Tool Machinery Co. was incorporated for $25,000 by F. Kiovsky, C. Kulovany and F. Janis.

NEW YORK—The Nassau Smelting & Refining Works, Ltd., 603 West Twenty-ninth street, will start work at once on the erection of a $50,000 plant at Tottenville, S. I.

NEW YORK—Operations of the Acme Cushion Wheel Co., 2 Columbus circle, recently incorporated for $200,000, will begin about Oct. 1. The company will manufacture steel disk wheels.

NEW YORK—The Warner Speed Control Corp. of America, Inc., was incorporated with a capital stock of $20,000 by W. G. Lovatt and G. and A. Wornsop It will manufacture motors, engines and like products.

NEW YORK—The Bronmore Bronze Corp. has been incorporated with $10,000 capital stock. It will manufacture brass and bronze lighting fixtures. A plant is now being operated at 117 East 129th street. L. H. Fischer, 33 Union Square West, is president.

NEW YORK—Work will be started shortly on the erection of a municipal motor repair shop at Sixteenth street and Avenue C. The steel contract, involving about 1200 tons, has just been placed with the McClintic-Marshall Co.

Industrial Business Changes Recently Announced

FULLER ENGINEERING CO. was recently appointed as sole licensee in the United States and Canada for all new business of the Quigley Fuel Systems, Inc. In the future all business of the Quigley Fuel Systems, Inc., will be conducted through the main and branch offices of the Fuller Engineering Co.

* * *

William C. Phelps & Co., general contractor, has moved its offices from 28 Clinton street to 21 Fulton street, Newark, N. J.

* * *

The Peninsula Iron & Steel Co. has moved its offices from 507 Mission street to 770 Folsom street, San Francisco.

* * *

Offices and plants of the American Welding & Tank Co., Tampa, Fla., were moved recently from 1414 Lozano street to Thirty-sixth street between Third and Fourth avenues. Expansion for more efficient service in addition to the installation of more new equipment is planned.

* * *

The Detroit Engineering society, formerly in the Detroit board of commerce building has moved its headquarters to 478 West Alexandrine avenue, Detroit.

* * *

Austin Co., general contractor, has moved its Philadelphia office from the Bulletin building to the Jefferson building, 1015 Chestnut street.

* * *

The Brown & Sharpe Mfg. Co., Providence, R. I., has announced the opening of its new offices in the California Bank building, Los Angeles.

* * *

Murray W. Sales & Co. has moved into its new location at 801 Baltimore avenue west at Third street, Detroit. The Sales company deals in pipe and manufactures plumbing fixtures.

* * *

The Thatcher Furnace Co., engaged in the manufacture of boilers, ranges and furnaces at Newark, N. J., has moved its general offices to 39-41 St. Francis street, that city.

* * *

The Austin Co. of California has moved its offices from the Pacific Electric building to 733-37 A. G. Bartlett building, 251 West Seventh street. John Harnish is Pacific coast manager.

* * *

Removal of its general offices to the Hampden building, 274 Main street, Springfield, Mass., was recently effected by the Palmer Steel Co., Inc. Its former office site was located at Holyoke, Mass., where its plant is situated.

* * *

Donnelly & Co., Philadelphia, dealers in blacksmiths' supplies, heavy hardware, metal lath, builders' supplies, coal and mine equipment, has removed its offices from 531-35 North Fourth street to 478 York avenue. Extensive improvements are being planned on the purchased site.

Bids on a portion of the machine tool equipment recently were closed.

NEW YORK—The Remington Automotive Corp., incorporated with a capital of $100,000, plans the construction of a plant in several months for the manufacture of automotive equipment. In the meantime assembly work is being done under contract by outside companies.

SALAMANCA, N. Y.—Manufacture of locomotive turnbuckles will be commenced immediately by the McArthur Turnbuckle Corp. which was recently incorporated with a capital stock of $35,000.

UTICA, N. Y.—The Huchman Mfg. Co. was incorporated with 1500 shares no par value common stock, 500 shares $100 par preferred stock and active capital of $20,000. The company will deal in machinery.

WEST ALBANY, N. Y.—It is proposed to rebuild the two mechanical rpeair shops here of the New York Central railroad, damaged by fire recently. The loss was about $70,000.

AKRON, O.—The capital stock of the East Akron Casting Co. was increased recently from $90,000 to $250,000.

CINCINNATI.—The capital stock of Hall's Safe Co. was increased from $150,000 to $250,000.

CINCINNATI—An involuntary petition in bankruptcy was filed recently in the United States district court against the Eureka Tackle Block Co., 428 East Pearl street.

CINCINNATI—The Gates Radio Co. was incorporated recently with a capital stock of $1,000,000 by L. J. Ainsworth, A. Gates, George W. Platt, F. J. Ruth and A. R. Ainsworth.

CLEVELAND.—About $45,000 will be spent in the construction of a 1-story building for the Glauber Brass Co., owned by M. H. Glauber, 7706 Pratt avenue.

CLEVELAND—The Eaton Axle & Spring Service Co. was incorporated recently with $500 capital, the incorporators being Grover Higgins, Leslie Nichols, Thomas O. Nevison, John M. Garfield and W. B. Cockley.

COLUMBUS, O.—The Diamond Metal Weather Strip Co. recently increased its capital from $25,000 to $50,000.

COLUMBUS, O.—Contracts for the erection of a factory building, 106 x 141 feet, on Marion road, were recently awarded by the Linde Air Products Co.

SALEM, O.—Fire starting from a spark from a cupola did about $3,000 damage to the plant of the Silver Mfg. Co. here recently.

West of the Mississippi River

FORT SMITH, ARK.—The Model Window Glass Co. will rebuild its plant burned recently with a loss of $200,000.

LOS ANGELES—Bids will be taken soon for the erection of a 1-story works, 50 x 90 feet, for the Perfo Piston Ring Co.

LOS ANGELES—O'Gera & Haynes have opened a boiler and tank manufacturing plant at 1820 East Slauson avenue.

LOS ANGELES.—The Brown & Sharpe Mfg. Co., Providence, R. I. has announced the opening of its offices in the California Bank building.

LOS ANGELES—The Lilley Foundry Co., 2272 Fifteenth street, has purchased a 5-acre site at East Twenty-sixth street and Downey boulevard.

OAKLAND, CAL.—The S. T. Johnson Co. is arranging for the removal of its plant to a new building at Arlington and Lowell streets where it plans to expand. The Johnson company manufactures oil burners and oil burning equipment.

OAKLAND, CAL.—Extensions and improvements in its plant in the Fruitvale industrial section is being planned by the Hammer-Bray Co., manufacturer of stoves, ranges, etc.

PITTSBURG, CAL.—Construction of a new plant here for a Pacific coast works of the Truscon Steel Co. is being planned.

KANSAS CITY, MO.—The erection of a new 2-story plant at 2800 East Thirteenth street will be started by the Security Metal Products Co., 2416 East Eighteenth street. The general contract for construction has been let to John Gosling, 242 Railway Exchange building.

NORTH KANSAS CITY, MO.—The American Brake Shoe & Foundry Co., 30 Church street, New York, plans to install equipment in its proposed new plant here to provide for an initial daily capacity of 75 tons of brake shoes. Several units together with a power house, costing approximately $350,000, will be built.

ST. LOUIS, MO.—G. E. Walker Co. was incorporated for $15,000 to manufacture radio equipment and electrical goods. The company is located at 1926 Chestnut street.

EUGENE, ORE.—The Eugene Foundry & Machine Co. has been incorporated for $20,000 by George W. Philler, James McGuire and R. T. Burghardt.

MT. VERNON, WASH.—Application has been made to the state for permit for a $100,000 hydroelectric plant development, the power to be used for light, power and heat in Skagit county. Allan Moore and assoates are fostering the movement.

SEATTLE, WASH.—The Robinson Gear & Machine Works have moved into a new factory building, just completed.

Business in Canada

FORT WILLIAM, ONT.—The Great Lakes Pulp & Paper Co. will undertake the erection of a $3,000,000 plant here following a recent agreement with the city.

HAMILTON, ONT.—The Canadian Westinghouse Co. will erect a new foundry building on which it now is taking bids.

OTTAWA, ONT.—The city council is in the market for equipment including a truck and hoist, an axle stand, tools for garages, power

(*Continued on Page* 632)

New Trade Publications

MARINE CONSTRUCTION—A 100-page illustrated booklet has just been published by Swan, Hunter & Wigham Richardson, Ltd., Wallsend-on-Tyne, England. It deals with the various shipbuilding industries on the Rivers Tyne, Clyde and Wear and its scope includes the iron and steel works which supply the yards. Descriptions and photographs of the plants and the ships built by them give an idea of the size of the industry in the British Isles.

NEW PLANT—Murray W. Sales & Co., Detroit, has published a 4-page illustrated leaflet describing its new location.

SANDBLAST EQUIPMENT.—The Pangborn Corp., Hagerstown, Md., has issued an illustrated folder showing several types and sizes of hose machines and sandblast cars. Each machine is illustrated and described briefly.

STEEL OFFICE SUPPLIES—The Angle Steel Stool Co., Plainwell, Mich., has published a 40-page catalog illustrating and describing different types of steel chairs, stools, tables, filing cases, etc., as well as light factory equipment such as trucks, benches and merchandise conveyors. A photograph and a list of the standard sizes accompany the description of each article.

CARBON DIOXIDE RECORDER—Bulletin No. 117 of the Uehling Instrument Co., Paterson, N. J., illustrates, in diagrammatic form, the principle of operation of carbon dioxide recording and indicating equipment which has no moving parts and employs no chemicals in liquid form. It operates on a principle based on varying gas tension between two orifices. The diagram shows the essential parts arranged as a train and includes the features required to obtain a suitable sample for flue gas analysis.

CENTERLESS GRINDER—A 12-page booklet illustrating and describing parts, assemblies and operation of a centerless grinder has been published by the Cincinnati Milling Machine Co., Cincinnati. The arrangement of the parts is shown by means of a diagram while the operation of the machine in straight cylindrical work and in shoulder grinding is illustrated by photographs. The description of the construction of the machine takes up such items as the spindle, wheel truing devices, work rest, speed control box and pumping system, a photograph of each accompanying the description.

Business in Canada

(*Continued from Page* 631)

hammer, cement gun, etc.

PETERBOROUGH, ONT.—Dick & Carew will require machinery for a planing mill and box factory.

ST. DAVIDS, ONT.—The Queenstown Quarries, Ltd., will install machinery for quarrying and stone cutting.

STRATFORD, ONT.—It is expected that the McLeod Milling Co. will rebuild without delay the plant and equipment which was damaged by fire with the loss of $50,000.

WINDSOR, ONT.—The Canadian Roofing Mfg. Co. will require equipment for a new plant to replace that recently damaged in a fire.

HULL, QUE.—The Ottawa & Hull Power Co., recently incorporated, plans the expansion of its productive powers from 40,000 horsepower to a capacity of 100,000 horsepower.

MONTREAL, QUE.—Fire damaged the plant of Ledoux Jennings Carriage Co., Osborn and Mountain streets, with a loss to building and machinery of $50,000.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron.$6.45
Mesabi Bessemer, 55 per cent iron.... 6.20
Old Range nonbessemer, 51½ per cent iron 5.70
Mesabi nonbessemer, 51½ per cent iron 5.55

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent ..... 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent..... 13.25 to 16.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent.... nominal
Swedish foundry or basic, 66 to 68 per cent..... 10.50 to 10.75
Spanish foundry or basic, 50 to 54 per cent..... 8.00 to 9.50

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent nominal
Indian, minimum 47 per cent ...(nominal) 40 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent .....43¾ cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton.$20.00 to $23.50
Washed gravel, imported, duty paid eastern tidewater, per net ton$19.60 to 20.00

Rivets

Structural rivets, Pittsburgh.. 3.00c to 3.25c
Boiler rivets, Pittsburgh .... 3.10c to 3.35c
Rivets, 7/16-in. and smaller..... .....65 and 10 to 65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank .....$3.75 off list
Hot pressed square or hexagon tapped ..... 3.75 off list
Cold punched square or hexagon blank ..... 3.75 off list
Cold punched, square or hexagon, ... 3.75 off list
Cold punched semifinished hexagon nuts ½-inch and larger.....75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller..80 and 5 off
Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(¾ x 6 inches, smaller and shorter)

Rolled thread .....50, 10 and 10 off
Cut thread .....50 and 10 off
Larger and longer .....50 and 10 off

MACHINE BOLTS
(¾ x 4 inches, hot pressed nuts)

Rolled thread .....60.10 and 5 off
Cut thread .....60 and 5 off
Larger and longer.....60 and 5 off
(¾ x 4 inches, cold punched nuts)
Cut thread .....45 and 10 off
Larger and longer .....45 and 10 off
Lag screws .....60 off
Plow bolts Nos. 1, 2 and 3 heads..... .....50 and 10 off
4 to 10 heads .....50-10 + 20 off
Stove bolts .....75, 10 and 5 off
Tap bolts .....25 and 10 off
Bolt ends with hot pressed nuts..... .....60 and 5 off
Bolt ends with cold punched nuts.... .....45 and 10 off
Blank bolts .....60 and 5 off
Wrought washers....$5.00 to 5.25c off list
Rough stud bolts with nuts..50 and 10 off

WASHERS

Wrought washers.....$5.00 to $5.25 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch .....+22
1¾-inch .....+12
2 and 2¼-inch .....+ 2
2½ to 3-inch 3
3¼ to 4½-inch 5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch ..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch ..... 29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch ..... 35 off
4-inch ..... 39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ... .
Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.
Add 5 per cent for lengths over 24 feet and not over 26 feet.
Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.
Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

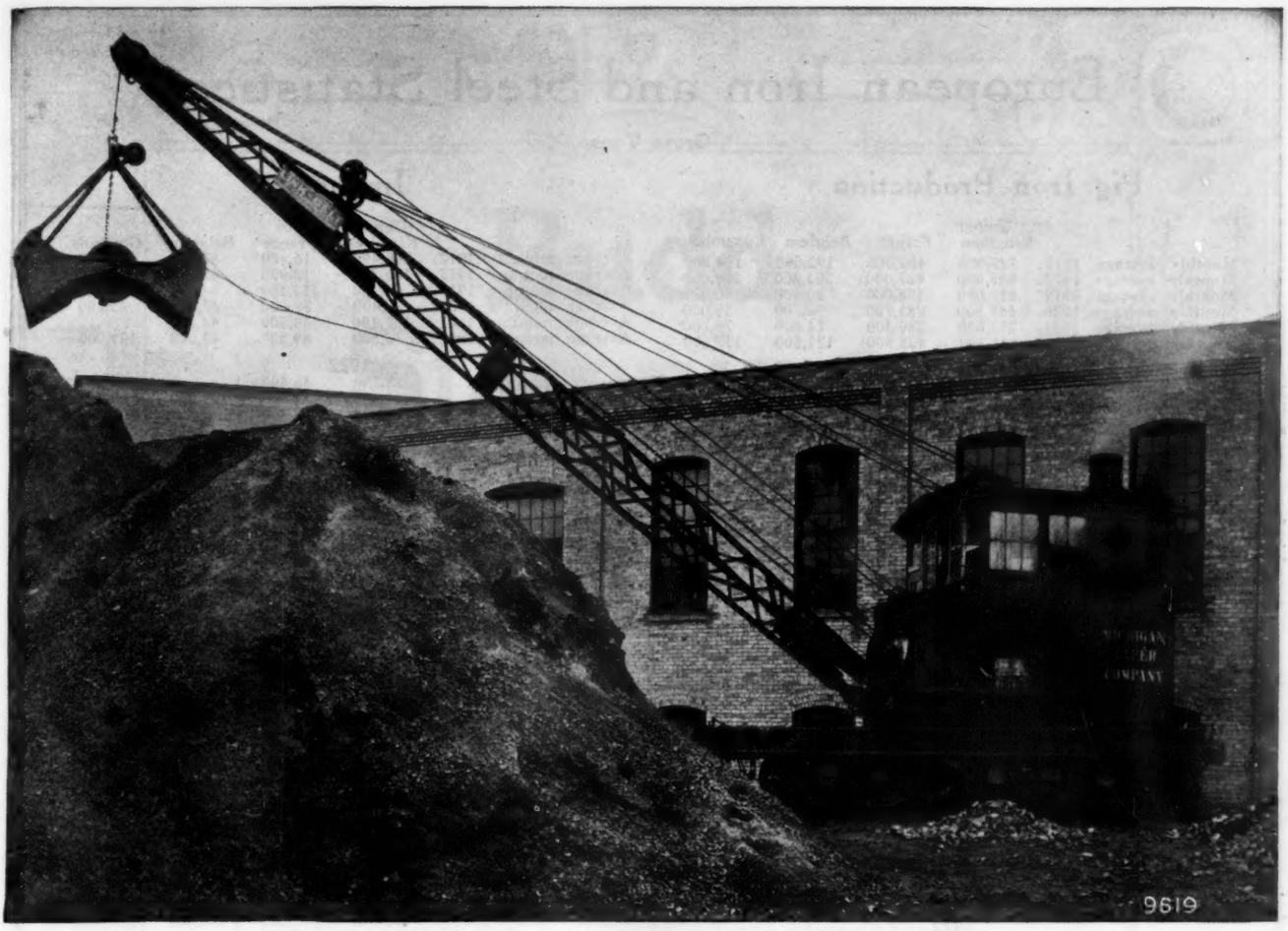
Carbon, 0.10 to 0.20 per cent .... 83 off
Carbon, 0.30 to 0.40 per cent .... 81 off
Carbon, 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.



Why It Pays to Store Coal Now!

THERE are five good reasons why every consumer of coal should buy and store his winter's supply of coal NOW.

1—financial advantage
2—assurance of coal
3—better quality of coal
4—lowering coal prices
5—relieving the nation's transportation systems and helping stabilize a billion dollar industry.

Five good reasons, four of which are purely individual and personal. Stored coal really means more money in your pocket—more heat in your fire-box.

How to store coal economically and profitably is something Link-Belt engineers have studied for many years. Let them show you how inexpensively and satisfactorily you can solve your winter's coal problem. Their wide experience and technical knowledge makes consultation worth while.

1314

LINK-BELT COMPANY

PHILADELPHIA, 2045 Hunting Park Ave.

New York . . . Woolworth Bldg.
Boston 9 . . . . 49 Federal St.
Pittsburgh . . . 335 Fifth Ave.
St. Louis . . Central Nat'l Bank Bldg.
Buffalo . . . 745 Ellicott Square

CHICAGO, 300 W. Pershing Road

Wilkes-Barre . . 2d Nat'l Bank Bldg.
Huntington, W. Va. Robson-Prichard Bldg.
Cleveland . . . 329 Rockefeller Bldg.
Detroit . . . . 4210 Woodward Ave.
Kansas City, Mo. . 306 Elmhurst Bldg.

Seattle . . . . 820 First Ave., S.
Portland, Ore. . . . 101 First St.
San Francisco . . 168 Second St.
Los Angeles . . 163 No. Los Angeles St.
Denver, Lindrooth, Shubart & Co., Boston Bldg.

INDIANAPOLIS, Belmont Ave. at Big Four R. R.

Atlanta, 610-611 Citizens and S'thrn. Bk. B'dg.
Louisville, Ky., Frederick Wehle, Starks Bldg.
New Orleans, C. O. Hinz, 504 Carondelet Bldg.
Birmingham, Ala. ,
S. L. Morrow, 720 Brown-Marx Bldg.

Link-Belt Ltd., Toronto and Montreal H. W. CALDWELL & SON CO., CHICAGO NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 709 Main St.

LINK-BELT

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912.	729,000	405,000	192,000	184,800
Monthly average 1913.	855,000	427,000	203,800	209,000
Monthly average 1919.	617,000	198,000	20,600	50,000
Monthly average 1920.	669,500	281,700	92,700	58,000
Monthly average 1921.	217,600	280,300	71,800	79,600
Monthly average 1922.	403,300	428,900	131,500	137,500
1922				
January	288,000	307,000	92,700	99,900
February	300,100	318,000	90,300	95,200
March	389,800	370,000	116,500	130,900
April	394,300	377,300	112,000	128,800
May	407,900	435,300	117,100	139,300
June	369,200	409,300	113,100	141,500
July	399,100	421,400	125,200	147,800
August	411,700	440,400	151,500	147,800
September	430,300	454,600	160,600	149,400
October	481,500	495,600	172,000	162,600
November	493,900	505,500	169,600	151,300
December	533,700	506,200	157,900	156,700
1923				
January	567,900	478,600	157,800	139,500
February	543,400	300,800	149,000	86,500
March	633,600	311,200	167,300	93,900
April	652,200	345,000	169,600	94,400
May	714,200	387,300	163,500	84,300
June	692,900	.....	169,300	88,400

Ingots and Castings Production

	United Kingdom	France	Belgium	Luxembourg
Monthly average 1912.	566,000	363,000	206,000	79,400
Monthly average 1913.	639,000	385,000	202,300	109,000
Monthly average 1919.	658,000	179,000	27,400	32,000
Monthly average 1920.	755,600	250,200	101,300	49,000
Monthly average 1921.	302,100	254,500	65,000	62,300
Monthly average 1922.	486,000	372,000	128,200	114,000
1922				
January	327,500	309,000	78,400	75,600
February	418,800	311,800	82,700	75,100
March	549,400	361,200	104,000	99,200
April	404,200	319,300	95,200	98,100
May	462,300	358,100	116,500	112,200
June	400,200	352,500	111,300	121,600
July	473,100	362,900	112,500	125,600
August	528,400	390,300	149,100	129,200
September	555,900	400,300	154,900	132,600
October	565,201	423,000	179,600	136,800
November	600,800	404,100	174,600	130,200
December	546,100	408,100	166,700	131,600
1923				
January	634,100	401,400	159,800	121,500
February	707,100	285,300	154,700	72,400
March	802,500	310,900	181,100	78,500
April	749,400	349,200	167,700	77,600
May	821,000	387,300	169,100	72,300
June	767,700	.....	186,000	73,200

Imports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	166,400	16,400	87,000	27,300
Average monthly 1913.	185,900	12,900	68,900	25,000
Average monthly 1919.	42,400	113,100	44,400	.....
Average monthly 1920.	92,400	89,000	67,000	26,200
Average monthly 1921.	137,100	38,500	43,300	.....
Average monthly 1922.	73,500	64,300	42,000	199,000
1922				
January	88,700	36,600		68,200
February	64,600	55,800	139,000	66,900
March	63,800	67,300		105,700
April	59,900	89,100	32,400	129,000
May	60,900	41,100	62,400	154,300
June	52,800	73,200		137,700
July	55,900	54,800		182,900
August	80,100	40,300	129,700	181,800
September	70,600	50,000		175,000
October	90,600	109,200		233,800
November	79,800	58,500	140,000	186,700
December	114,000	109,500		239,600
1923				
January	128,900	55,800	45,100	191,300
February	122,700	63,800	40,000	82,500
March	111,000	38,000	35,200	93,200
April	115,400	44,200	32,800	143,900
May	82,200	37,000	.....	.....
June	105,100	.....	.....	.....

Exports

	United Kingdom	France	Belgium	Germany
Average monthly 1912.	400,600	41,500	124,500	482,400
Average monthly 1913.	414,100	48,200	128,800	516,900
Average monthly 1919.	186,100	19,400	14,500	.....
Average monthly 1920.	270,900	74,600	74,300	143,600
Average monthly 1921.	141,700	132,700	75,900	176,000
Average monthly 1922.	283,400	164,000	143,000	209,700
1922				
January	235,300	164,000		218,200
February	223,400	107,000	198,400	170,000
March	295,800	72,300		208,700
April	258,400	125,800	83,900	195,500
May	272,400	122,200	279,600	204,500
June	236,300	180,300		209,132
July	251,700	182,100		206,200
August	270,000	168,400	522,600	181,300
September	279,200	174,000		223,500
October	347,100	235,600		229,908
November	372,300	181,300	631,200	210,000
December	114,000	221,700		258,900
1923				
January	353,400	158,500	202,200	212,900
February	317,600	236,500	162,200	183,500
March	368,100	139,200	200,000	115,100
April	387,000	120,600	192,000	105,100
May	424,500	140,000	.....	.....
June	365,100	.....	.....	.....

Note—Belgian figures include Luxembourg since May 1, 1922.

Export and import figures do not include scrap.

American Iron and Steel Exports and Imports

Gross Tons

	Imports	Exports
1923		
June	67,968	176,523
May	75,840	195,535
April	77,894	183,905
March	106,050	168,176
February	67,682	135,046
January	119,955	134,441
1922		
December	96,358	154,087
November	152,250	124,004
October	184,202	131,542
September	76,393	128,370
August	49,054	144,264
July	62,426	157,027
June	39,154	216,298
May	23,098	229,616
April	18,720	197,562
March	12,774	206,474
February	11,535	133,333
January	13,404	155,962
Total	643,010	1,988,539
1921		
December	9,400	134,348
November	9,296	125,492
October	10,609	106,466
September	11,743	94,650
August	8,069	75,641
July	10,040	85,520
June	8,260	119,021
May	10,915	140,987
April	4,847	160,921
March	14,492	210,451
February	3,650	387,900
January	15,784	516,447
Total	117,105	2,156,818
1920		
December	15,120	499,780
November	50,995	434,290
October	39,797	451,972
September	31,825	408,605
August	58,335	431,519
July	32,742	419,230
June	40,549	392,780
May	29,125	419,064
April	29,681	395,583
March	38,377	426,448
February	36,491	308,128
January	45,796	333,514
Total	448,833	4,920,913
1919		
1919	327,490	4,405,281
1918	168,225	5,372,424
1917	324,565	6,442,240
1916	310,891	5,947,646
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,301,981
1906	577,809	1,325,740
1905	416,000	1,010,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	411,915
1901	221,297	81,211
1900	209,955	286,687

Budd Stampings

"A remarkable combination of high quality and low price"

When you buy your stampings from us you save scrap loss. We do not charge you for more material than is actually used.

When you buy your stampings from us you pay no die maintenance cost. *This means a big saving, too,* especially where operators do not thoroughly understand dies.

The Budd Company's Stampings are made of materials that come fully up to specifications—and the workmanship is of the very best.

Tell us your requirements. We shall gladly submit estimates.

ADDRESS

SPECIALTY DEPARTMENT

EDW. G. BUDD MFG. CO.

Makers of All-Steel Automobile Bodies

2500 Hunting Park Ave.

PHILADELPHIA, PA.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.50 to 15.00
Boston (dealers)	11.50 to 12.00
Buffalo	17.00 to 18.00
Chicago	16.25 to 16.75
Cleveland	15.50 to 15.75
Cincinnati	14.50 to 15.00
Detroit dealers)	14.00 to 14.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.50 to 13.00
Pittsburgh (dealers)	18.50 to 19.00
St. Louis	16.00 to 16.50
Valleys (nominal)	15.50 to 16.50
No. 1 railroad steel New York (dealers)	13.00 to 13.50

BUNDLED SHEETS

Buffalo	$15.00 to 15.50
Cleveland	11.75 to 12.25
Cincinnati	12.00 to 12.50
Detroit	9.50 to 10.00
Eastern Pennsylvania	13.50 to 14.00
Pittsburgh	16.50 to 17.00
St. Louis	8.50 to 9.00
Valleys	14.50 to 15.00

STEEL RAILS, SHORT

Birmingham	17.00 to 17.50
Boston (dealers)	11.50 to 12.00
Chicago	20.00 to 20.50
Cincinnati	20.00 to 20.50
Cleveland	16.00 to 16.25
St. Louis	17.50 to 18.00

STOVE PLATE

Birmingham	14.50 to 15.00
Boston (consumers)	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago	17.50 to 18.00
Cincinnati (net tons)	10.00 to 10.50
Cleveland	15.50 to 16.00
Detroit (net)ton (dealers)	13.00 to 1400
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	13.00 to 13.50
Pittsburgh	15.00 to 15.50
St. Louis	15.50 to 16.00

LOW PHOSPHORUS

Buffalo	23.50 to 24.50
Cincinnati	15.50 to 16.00
Eastern Pennsylvania	22.50 to 23.00
Pitts. billets and bloom crops	23.00 to 24.00

SHOVELING STEEL

Chicago	16.00 to 16.50
Pittsburgh	15.00 to 15.50
St. Louis	16.00 to 16.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	21.50 to 22.00
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	21.50 to 22.00
St. Louis	20.50 to 21.00

COMPRESSED SHEETS

Buffalo	15.00 to 16.00
Chicago	13.50 to 14.00
Cleveland	14.50 to 15.00
Detroit dealers)	12.50 to 13.50
Pittsburgh	17.50 to 18.00
Valleys	17.00 to 17.25

FROGS, SWITCHES, GUARDS

Chicago	16.50 to 17.00
Eastern Pennsylvania	15.50 to 16.50
St. Louis	17.00 to 17.50

BOILER PLATE, CUT

St. Louis	11.50 to 12.00

ANGLE BARS—STEEL

Chicago	16.75 to 17.25
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	14.50 to 15.00
Boston (dealers)	14.00 to 14.50
Buffalo	15.00 to 16.00
Chicago No. 1	17.50 to 18.00
Chicago, No. 2	16.75 to 17.00
Cincinnati No. 1	13.50 to 14.00
Detroit, No. 2	12.50 to 13.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh, No. 1	16.00 to 16.50
Pittsburgh, No. 2	18.50 to 19.00
New York, No. 1 (dealers)	15.50 to 16.50
St. Louis, No. 1	16.25 to 16.75
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	10.00 to 10.50
Buffalo	14.00 to 15.00
Eastern Pennsylvania	15.50 to 16.50
New York (dealers)	11.50 to 12.00

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	16.50 to 17.50

CITY WROUGHT

New York, long	14.00 to 14.50

BUSHELING

Buffalo, No. 1	15.50 to 16.00
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	12.00 to 12.50
Cincinnati, No. 1	11.00 to 11.50
Cleveland, No. 1	12.00 to 12.50
Cleveland, No. 2	10.00 to 10.50
Detroit, No. 1	11.50 to 12.00
Detroit, No. 2 (new)	10.50 to 11.00
Detroit, No. 2 (old)	8.50 to 9.00
Eastern Pennsylvania	16.00 to 17.00
Pittsburgh, No. 1	16.00 to 16.50
St. Louis No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (dealers)	8.50 to 9.00
Buffalo	8.00 to 9.00
Chicago	10.25 to 10.75
Cleveland	12.00 to 12.50
Cincinnati (net tons)	9.00 to 9.50
Detroit (dealers)	9.00 to 9.50
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	10.00 to 10.50
Pittsburgh	12.00 to 12.50
St. Louis	9.00 to 9.50
Valleys	13.00 to 13.50

CAST IRON BORINGS

Birmingham (chemical)	16.50 to 17.00
Birmingham (plain)	9.00 to 10.00
Boston (chemical)	12.50 to 13.00
Boston (dealers)	8.50 to 9.00
Buffalo	14.00 to 14.50
Pittsburgh	16.00 to 16.50
Chicago	12.00 to 12.50
Cincinnati (net tons)	9.50 to 10.00
Cleveland	13.00 to 13.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	14.50 to 15.50
Eastern Pennsylvania (chem.)	17.00 to 19.00
New York (dealers' price)	10.50 to 11.00
St. Louis	13.50 to 14.00
Valleys	15.50 to 16.50

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	8.50 to 8.75
Cleveland	12.75 to 13.00
Detroit (dealers)	10.75 to 11.25
Eastern Pennsylvania	15.00 to 15.50
New York (dealers)	9.00 to 10.00

IRON AXLES

Birmingham	24.00 to 25.00
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	28.50 to 29.00
Cincinnati	22.50 to 23.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	20.00 to 21.00
Chicago	21.50 to 22.00
Cincinnati	13.50 to 14.00
St. Louis	16.00 to 16.50

PIPES AND FLUES

Chicago	11.00 to 11.50
Cincinnati	10.00 to 10.50
Cleveland	10.50 to 11.00
St. Louis	11.50 to 12.00

RAILROAD GRATE BARS

Buffalo	17.00 to 17.50
Chicago	14.50 to 15.00
Cleveland	15.50 to 16.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.00 to 13.50
St. Louis	15.00 to 15.50

FORGE FLASHINGS

Boston (dealers)	9.50 to 10.00
Chicago, small	11.50 to 12.00
Cleveland, small	13.00 to 13.50
Cleveland, large	12.50 to 13.00
Detroit (dealers)	10.50 to 11.50

FORGE SCRAP

Boston (dealers)	9.50 to 10.00
Chicago	20.00 to 21.00
Eastern Pennsylvania	13.50 to 14.50

ARCH BARS AND TRANSOMS

Chicago	25.50 to 26.00
St. Louis	22.50 to 23.00

ANGLE BARS—IRON

Chicago	26.00 to 26.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.00 to 11.50
Buffalo	17.00 to 18.00
Chicago	13.00 to 13.50
Cleveland	15.50 to 15.75
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	15.50 to 16.00
St. Louis	14.00 to 14.50

STEEL CAR AXLES

Birmingham	20.00 to 21.00
Boston (consumers)	20.00 to 21.00
Buffalo	24.50 to 25.50
Chicago	20.00 to 21.00
Cleveland	22.00 to 22.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	nominal
Pittsburgh	20.50 to 21.00
St. Louis	21.00 to 21.50

SHAFTING

Boston (consumers)	20.00 to 21.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	18.50 to 19.00
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	18.50 to 19.00
Birmingham, iron	18.00 to 18.50
Boston (consumers)	22.00 to 23.00
Buffalo, iron	16.50 to 17.50
Chicago, iron	19.50 to 20.00
Cincinnati	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
New York iron (dealers)	16.00 to 17.00
Pittsburgh, iron	20.50 to 21.00
Pittsburgh, steel	21.50 to 22.00
St. Louis, iron	18.50 to 19.00

NO. 1 CAST SCRAP

Birmingham, cupola	19.50 to 20.00
Boston (consumers)	22.50 to 23.00
Buffalo	19.50 to 20.50
Chicago, cupola	20.50 to 21.00
Cincinnati No. 1 machinery cupola (net tons)	19.50 to 20.00
Cleveland, cupola	21.50 to 22.00
Detroit (net ton) (dealers)	18.50 to 19.00
Eastern Pennsylvania, cupola	20.50 to 21.00
New York, cupola (dealers)	17.00 to 18.00
Pittsburgh, cupola	22.00 to 22.50
San Francisco	26.00 to 28.00
St. Louis, railroad	20.50 to 21.00
St. Louis, agricultural	20.50 to 21.00
Valleys	20.00 to 21.00

HEAVY CAST

Boston (consumers)	20.00 to 21.00
Buffalo	16.00 to 17.00
Cleveland	15.00 to 15.50
Detroit (automobile) (net)ton	21.00 to 22.00
Eastern Pennsylvania	18.50 to 19.50
New York (dealers)	16.00 to 16.50
Pittsburgh	19.00 to 19.50

MALLEABLE

Boston (railroad) (consumers)	22.00 to 23.00
Buffalo	20.00 to 21.00
Chicago, railroad	20.50 to 21.00
Chicago, agricultural	18.00 to 19.00
Cincinnati, agricultural	15.50 to 16.00
Cincinnati, railroad	17.00 to 17.50
Cleveland, agricultural	20.50 to 21.00
Cleveland, railroad	21.50 to 22.00
Detroit (dealers)	19.50 to 20.50
Eastern Pennsylvania, railroad	17.00 to 17.50
Pittsburgh, railroad	20.50 to 21.00
St. Louis, agricultural	19.00 to 19.50
St. Louis, railroad	19.00 to 19.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.00 to 17.50
Boston (dealers)	14.00 to 14.50
Chicago	17.75 to 18.00
Cleveland	20.00 to 20.50
Detroit	14.00 to 14.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
Pittsburgh district	19.50 to 20.00
St. Louis	17.50 to 18.00

LOCOMOTIVE TIRES

Chicago	17.50 to 18.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	19.00 to 19.50
Eastern Pennsylvania	22.50 to 23.00
Pittsburgh	21.50 to 22.00